

パキスタン国
国立省エネルギーセンター
パキスタン技術者協会

パキスタン国
建築分野省エネルギー制度構築促進
のための情報収集・確認調査
【有償勘定技術支援】

ファイナルレポート
別添資料

平成28年 1月
(2016年)

独立行政法人国際協力機構
(JICA)

共同企業体代表者

株式会社 福永設計

構成員

株式会社アジア共同設計コンサルタント
日本工営株式会社

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16-001

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1. 調 査 工 程

Project: **Data Collection Survey on Energy Efficiency and Conservation in the Building Sector**

Survey Schedule

Name of Expert: Mr. Hirooka, Fukunaga Architects- Engineers
 Mr. Kohno, Asia Engineering Consultant Co. Ltd.,
 Mr. Kuroki, Nippon Koei Co. Ltd.,

Date	Time	Hirooka	Time	Kuroki and Kohno			
June	1 Mon	11:45	Narita→Bangkok (15:45)	TG641	11:45	Narita→Bangkok (15:45)	TG641
		18:50	Bangkok→Islamabad (22:25)	TG349	18:50	Bangkok→Islamabad (22:25)	TG349
			Check in Hotel (Islamabad)			Check in Hotel (Islamabad)	
	2 Tue	9:00	Meeting with JICA Pakistan Office	JICA		Same as on the left	
		11:30	Meeting with PEC	PEC			
	3 Wed	11:00	Meeting with Ministry of Science and Technology	MoWP		Same as on the left	
			Meeting with candidate companies for Sub- contract				
	4 Thu	9:45	Meeting with ENERCON	ENERCON		Same as on the left	
		11:30	Meeting with Pakistan Procurement Regulatory Authority	PPRA			
		12:30	Meeting with Ministry of Housing and Works	MOHW			
	5 Fri	11:00	Meeting with Capital Development Authority	CDA		Same as on the left	
	6 Sat		Documentation			Documentation	
	7 Sun		Documentation			Islamabad → Lahore (by car?)	
	8 Mon	14:00	Meeting with ENERCON	ENERCON	12:00	Meeting with Constructors Association of Pakistan CAP	CAP
		15:30	Meeting with Construction Company (Tobishima)	TOBISHIMA	16:00	Meeting with Muslim Commercial Bank	MCB
	9 Tue	9:00	Meeting with consultant (Sustainable Technologies)	Ramada Hotel	8:30	Meeting with JICA	Hotel
		16:00	Meeting with developer (Baharia)	Baharia	11:00	Meeting with Lahore Development Authority	LDA
		17:00	Meeting with construction company (Land Mark)	Land Mark	14:00	Meeting with Housing, Urban Development and Public Health Engineering of Punjab govt	HUD & PHUD
				17:00	Walk through survey at construction site	Site	
10 Wed	9:00	International Conference (PGSRET-2-15)		12:00	Lahore→Karachi (13:45)	PK1736	
	11:30	Meeting with PEC	PEC	14:30	Karachi Metropolitan Corporation	KMC	
	12:00	Meeting with MOHW & PWD	MOHW	16:30	Walk through survey on Shopping mall	Site	
	13:30	Meeting with IAP	Tuscany Court				
	16:00	Meeting with candidate sub-contractor (FINITE)	Ramada				
11 Thu	9:00	Meeting with candidate sub-contractor (ST)	Ramada	9:00	Meeting with Sindh Building Control Authority	SBCA	
	14:00	Building Material & Equipment research	Rawalpindi	12:00	Meeting with Pakistan Metrological Department	PMD	
	20:00	JICA meeting	Serena Hotel	16:00	Meeting with Association of Builders and Developers	ABAD	
				17:00	Walk through survey at construction site	Site	
12 Fri	9:30	Meeting with maintenance/ building equipment company	PECT	9:00	Meeting with State Bank of Pakistan	SBP	
	14:30	Meeting with candidate sub-contractor (Designmen)	Designmen	11:00	Meeting with Pakistan Metrological Department	PMD	
				15:00	Meeting with JETRO	JETRO	
				19:00	Karachi→Islamabad (20:55)	PK370	
13 Sat	11:00	Walk through survey at construction site	Site		Same as on the left		
14 Sun		Documentation			Documentation		
15 Mon	11:00	Meeting with MoST	MoST		Same as on the left		
	14:00	Contract Signing with sub-contractor (Designmen)	Designmen				
16 Tue	10:00	Meeting with ENERCON	ENERCON		Same as on the left		
	12:00	Meeting with sub-contractor (Designmen)	Designmen				
	13:00	Meeting with PEC	PEC				
	15:00	Walk through survey on Hotel	Site				
17 Wed	9:30	Wrap up meeting with ENERCON	ENERCON	9:30	Wrap up meeting with ENERCON	ENERCON	
	23:20	Islamabad→Bangkok(06:25)	TG350	23:20	Islamabad→Bangkok(06:25)	TG350	
18 Thu	7:35	Bangkok→Narita (15:45)	TG676	7:35	Bangkok→Narita (15:45)	TG676	

Data Collection Survey on Energy Efficiency and Conservation in the Building Sector
Second Survey Actual Schedule

Date			Mr. Hirooka (17-Aug to 12-Sep) Mr Kono (All)	Mr. Kuroki (3-Aug to 29-Aug) Mr Kono (All)
3-Aug	Mon	AM PM	In Japan	Transferring Haneda - Islamabad (22:25) (Mr. Kuroki)
4-Aug	Tue	AM PM		Meeting with relevant ■ Meeting with MOWP, Enercon 8:15 ■ Meeting with Sub-contractor
5-Aug	Wed	AM PM		■ Meeting with MOHW 11:00 ■ Meeting with PEC 14:30
6-Aug	Thu	AM PM		■ Meeting with CDA 11:00 ■ Meeting with PEPAC 14:00 ■ Meeting with Pakistan HVACR Society 17:00
7-Aug	Fri	AM PM		■ Internal Discussion (Mission Team) ■ Sorting out last week meetings
8-Aug	Sat	AM PM		■ Internal Discussion (Mission Team) ■ Sorting out last week meetings
9-Aug	Sun	AM PM		■ Preparation for next week meetings
10-Aug	Mon	AM PM		■ Meeting with RDA 12:30 ■ Meeting with Sub-contractor
11-Aug	Tue	AM PM		■ Meeting with Emaar Pakistan 11:00 ■ Meeting with Baharia Town 15:00
12-Aug	Wed	AM PM		■ Meeting with Sub-contractor 13:30 ■ Meeting with NEPRA 15:30
13-Aug	Thu	AM PM		■ Meeting with Constructors Technical Training Institution 11:00 ■ Meeting with USAID Pakistan office 15:00
14-Aug	Fri	AM PM		Independence day ■ Site walk through in Islamabad ■ Site walk through in Islamabad
15-Aug	Sat	AM PM		■ Internal Discussion (Mission Team) ■ Sorting out last week meetings
16-Aug	Sun	AM PM		■ Preparation for next week meeting
17-Aug	Mon	AM PM		Transferring (Hirooka) Narita- Islamabad (22:25) (Mr. Hirooka) ■ Meeting with DHA Islamabad 11:00 ■ Meeting with PWD 15:00
18-Aug	Tue	AM PM		■ Meeting with IESCO 14:00 ■ Meeting with MOWP, Enercon 16:30
19-Aug	Wed	AM PM	■ Meeting with MOST 11:30 ■ Meeting with Federal Board of Revenue 14:30 ■ Designmen 16:30	
20-Aug	Thu	AM PM	■ Meeting with GIZ 11:00 ■ Document preparation	
21-Aug	Fri	AM PM	■ Document preparation ■ Meeting with JICA 17:00	
22-Aug	Sat	AM PM	■ Internal Discussion (Mission Team) ■ Sorting out last week meetings	
23-Aug	Sun	AM PM	■ Preparation for next week meetings Islamabad- Lahore	
24-Aug	Mon	AM PM	■ Joint Meeting under HUD & PHED (invite relevant DA) 11:00 ■ Document preparation	
25-Aug	Tue	AM PM	■ Meeting with LESCO 11:00 ■ Meeting with Insulation manufacturer 15:00	
26-Aug	Wed	AM PM	■ Document preparation ■ Document preparation	
27-Aug	Thu	AM PM	■ Punjab Revenue Authority PRA 11:00 ■ Meeting with Panjab Industrial Estate 15:00 ■ Meeting with Glass Manufacturer (Ghani) 17:00	

28-Aug	Fri	AM		■ Pnajib Government Energy Department 11:00		■ same as on the left
		PM		■ Meeting with Pakistan Green Building Council 15:00		Lahore→Bangkok(06:10)
29-Aug	Sat	AM		■ Internal Discussion (Mission Team)	Transferring	Bangkok→Narita (15:45)
		PM		■ Sorting out last week meetings		
30-Aug	Sun	AM		■ Preparation for next week meeting		
		PM		■ Lahore- Karachi 18:00-19:45		
31-Aug	Mon	AM		■Housing Building Finacial Company Karachi 11:00		
		PM		■ Meeting with SBCA 15:00		
1-Sep	Tue	AM		■ Meeting with Pakistan Council of Architects and Town Planners 11:00		
		PM		■ Document preparation		
2-Sep	Wed	AM		■Meeting with Tobishima Costructon Company 11:00		
		PM		■Meeting with ABAD 14:00		
3-Sep	Thu	AM		■Meeting with Pakistan Cable Alumnum 11:00		
		PM		■ Document preparation		
4-Sep	Fri	AM		■ Shindh Industrial Trading Estate 11:00		
		PM		■ Meeting with Builder 17:00		
5-Sep	Sat	AM		■ Internal Discussion (Mission Team)		
		PM		■ Sorting out last week meetings		
6-Sep	Sun	AM		■ Preparation for next week meetings		
		PM				
7-Sep	Mon	AM		■ Document preparation		
		PM		■ Meeting with Ali Arshad Associate 14:00		
8-Sep	Tue	AM		■ Meeting with JICA expert team 8:30		
				■ Meeting with DHA 10:00		
		PM		■ Meeting with Construction Site of ABAD (King's Goup) 14:00		
9-Sep	Wed	AM	Transferring	■Meeting with EMAAR 10:30		
				■Meeting with Ahd Associate Architects 14:00		
		PM		■ Karachi-Islamabad 19:00-20:55		
10-Sep	Thu	AM		■ Wrap up meeting with PEC 9:30		
		PM		■ Wrap up meeting with MOWP12:30		
11-Sep	Fri	AM		■ Report to JICA office 11:30		
		PM		■ KFW meeting 16:00 Islamabad→Bangkok(06:25)		
12-Sep	Sat	AM		Islamabad→Bangkok(06:25)		
		PM		Bangkok→Narita (15:45)		

In Japan

Data Collection Survey on Energy Efficiency and Conservation in the Building Sector
Third Survey Actual Schedule

Date		Mr. Hirooka Mr. Kuroki Mr. Kohno (Nov 27 ~ Dec 28)		Expected Participants	Transportation	Agenda	Accommodation
27-Nov	Fri	AM	Transferring Kono	Kaisai- Islamabad (22:25) (Mr. Kono)	■ Flight ■ Car (Hotel Transport)	Transferring	Capris Exective (Islamabad)
		PM					
28-Nov				Follow up for sub-contractor survey	■ Car		Capris Exective (Islamabad)
5-Dec	Sat	AM	Transferring Hirooka Kuroki	Narita- Islamabad (22:25) (Mr. Hirooka) Haneda - Islamabad (22:25) Mr. Kuroki	■ Flight ■ Car (Hotel Transport)	Transferring	Best Western hotel (Islamabad)
		PM					
6-Dec	Sun	AM	Transferring		■ Flight ■ Car (Hotel Transport)		Best Western hotel (Islamabad)
		PM					
7-Dec	Mon	AM	Meeting	■ Meeting with sub-contractor (Desginmen) ■ Meeting with Mr. Hagihara Team Leader of ES&L		Discussion on survey project Discussion on EE&C	Best Western hotel (Islamabad)
		PM					
8-Dec	Tue	AM	Meeting	■ Task Force Committee Meeting ■ Meeting with JICA Pakistan	■ Car	Presentation of findings to Task force members Briefing and discussion of Draft Final Report	Best Western hotel (Islamabad)
9-Dec	Wed	AM	Meeting	■ Meeting with UNHABITAT ■ Meeting with sub-contractor (Desginmen)	■ Car	1 Briefing and discussion of Draft Final Report 2 Discussion on project of UNHABITAT for existing government building Discussion	Best Western hotel (Islamabad)
		PM					
10-Dec	Thu	AM		Internal preparation	■ Car		Best Western hotel (Islamabad)
		PM					
11-Dec	Fri	AM	Meeting	■ CDA Revenue Department ■ Ministry of Climate Change ■ Tobishima Corporation	■ Car	1 Clarification of key items regarding revenue 2 Property Tax system in Islamabad 3 Proposed tax reduction as incentive 1 Briefing draft final report. 2 Activities of MoCC for Energy Efficiency and Enviroment. 3 New projects for green buildings	Best Western hotel (Islamabad)
		PM					
12-Dec	Sat	AM		■ Sorting out last week meetings	■ Car		Best Western hotel (Islamabad)
		PM					
13-Dec	Sun	AM		■ Preparation for next week meetings	■ Car		Best Western hotel (Islamabad)
		PM					
14-Dec	Mon	AM	Meeting	■ NESPAK Internal work	■ Car	1 Briefing on draft final report 2 Activities of NESPAK for energy efficient buildings	NESPAK Office
		PM					
15-Dec	Tue	AM	Meeting	■ UNIDO Pakistan Internal work	■ Car	1 Discussion of action plan 2 UNIDO Project. 2 Solarization of public buildings	UNIDO Office, Serena Business Complex
		PM					
16-Dec	Wed	AM	Meeting	■ IMS Internal work	■ Car	1 Maintenance solutions in Pakistan 2 Buildings being maintained by IMS 3 Issues & barrier 4 Discussion of improvement	Best Western hotel (Islamabad)
		PM					
17-Dec	Thu	AM	Meeting Survey	■ CDA Planning and Engineering Departments ■ Government quarter walk through	■ Car	1 Expranation of action plan idea and detail activity 2 Briefing Action Plan for model city 3 Incentives 4 Adopction of BCP-EP-2011	Best Western hotel (Islamabad)
		PM					
18-Dec	Fri	AM	Meeting Survey	■ Meeting with sub-contractor (Desginmen) ■ Market Survey of Airconditioner	■ Car	1. Clarification on survey 2. Construction Cost information 3. CDA urban design sample	Best Western hotel (Islamabad)
		PM					
19-Dec	Sat	AM		■ Internal Discussion (Mission Team) ■ Sorting out last week meetings	■ Car		Best Western hotel (Islamabad)
		PM					
20-Dec	Sun	AM		■ Preparation for next week meetings	■ Car		Best Western hotel (Islamabad)
		PM					
21-Dec	Mon	AM	Meeting	■ IESCO Head Office Internal work	■ Car	1 Confirmation of electric contract of IESCO, residential, commercial, industrial and others. 2 Billing system and revenue generation	Best Western hotel (Islamabad)
		PM					
22-Dec	Tue	AM	Meeting	■ Meeting with USAID	■ Car		Best Western hotel (Islamabad)
		PM					
23-Dec	Wed	AM	Meeting	■ Meeting with ENERCON	■ Car	Wrap-up meeting	Best Western hotel (Islamabad)
		PM					
24-Dec	Thu	AM		Internal work ■ JICA Meeting	■ Car	1 Report of wrap up meeting with MOWP 2 Explanation of making policy for Final Report	Best Western hotel (Islamabad)
		PM					
25-Dec	Fri	AM		Internal work Islamabad→Bangkok(06:10) Hirooka/ Kuroki	■ Flight ■ Car		Best Western hotel (Islamabad)
		PM					
26-Dec	Sat	AM	Transferring Hirooka Kuroki	Bangkok→Narita (15:45)	■ Flight ■ Car		Best Western hotel (Islamabad)
		PM					
27-Dec	Sun	AM	Mr. Kohno	Internal work	■ Car		Best Western hotel (Islamabad)
		PM					
28-Dec	Sat	AM	Transferring Kono	Internal work Islamabad→Bangkok(06:10) Kono	■ Flight		
		PM					
29-Dec	Sat	AM	Transferring Kono	Bangkok→kansai (18:10)	■ Flight		
		PM					

2. 議 事 録

MEETING MEMO

Date	2 nd June, 2015	Time	11:30 a.m to 1:00 p.m
Organization	Pakistan Engineering Council Venue: Pakistan Engineering Council, G-5/2, Islamabad		
Department			
Attendances	PEC: Engr. Ghulam Karim – Deputy Register/ HOD Sc. Faiz ul Sibtain – Project Liaison Coordinator for Building Code of Pakistan (Energy Provisions-2011) / Junior Executive JICA: Mr. Imran Ahmad JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents	Building Code of Pakistan (Energy provisions 2011) Professional Development of engineers bye-law 2008		
Discussed	<p><u>Presentation of summary of this project</u></p> <p>At the outset, JICA explained that JICA started the project regarding energy efficiency and conservation on building sector in Pakistan. This project is specifically aimed to gather necessary data in order to support energy sector reform.</p> <p><u>Submission and discussion of inception report</u></p> <p>JST submitted and discussed inception report with PEC. PEC indicated that they will support this project as much as possible.</p> <p><u>Implementation of Building code of Pakistan</u></p> <ul style="list-style-type: none"> ● As per mandate under PEC Act -1976, PEC developed the Pakistan Building Code Energy Provision-2011. (PBCEP) was notified with issuance of a Statutory Regulation Order (S.R.O.). After that PEC devised effective implementation plan and officially launched the said Code . The implementation of the PBCEP is responsibility of respective Development Authority (DA) including building controlling authorities at province, district level responsibility. (i.e. CDA, LDA, RDA) ● Code compliance for the federal government buildings are to be managed by CDA ● There is an entity to inspect building code compliance on site under DA. This entity inspects site twice (1. during construction 2. at completion) and provides comprehensive inspection report for code compliance. ● Permit application form and required drawing should be available at DA. Each Province/ district Authority may have its own format and requirements. ● Evaluation method is also under Local DA control. ● No handbook or guidebook has been prepared. PEC agreed that the handbook/ guidebook for both skilled professionals as well as building users are necessary to improve building energy conservation. <p><u>Energy Provision</u></p> <ul style="list-style-type: none"> ● First task for development of Building Energy Code was given to NESPAK, after that it was handed over to ENERCON and finally given to PEC. PEC as per legal mandate successfully accomplished the task well on time. ● BEC-EP-2011 can facilitate also the construction material manufactures to make energy efficient building materials. ● Pakistan Council of Scientific and Industrial Research (PCSIR) and PSQCA has facility to test and approve equipment specification if proposed product is code compliant. ● One of the problems is that imported items and some local manufactured items needs proper power ratings as per required compliance of BEC-EP-2011. Further after testing and certification by GOP approved labs said product must be labeled before marketingt. Shortage of laboratory may be causing problem. ● PEC's view for next revision on PBCEP includes broader applicability with respect to building size.(i.e. 		

Floor area 1200m²→500 m², electrical contract 100kVA → 50kVA), which could be modified.

- Buildings with more than 100kVA of contract are regarded as large scale building in Pakistan. Such buildings exist mainly in big cities.
- There is no need of climatic zoning in case of available data, if it is not available then climatic zone data of respective variable might be included as Annex in the revised edition of BEC-EP-2011
- As per mandate PEC would initiate the task revision and updation of BEC-EP-2011 in the next year 2016 after completion of three years as notified. PEC would like to submit proposal to JICA

Other Building Code

- Building Code of Pakistan (Seismic Provisions-2007)
- Building Code of Pakistan Fire Safety Provisions (Development of code is in progress).
- Pakistan Electric and Telecommunication Safety code is developed and under process of notification by GOP.

Available Data

- MOHW may have drawing for recent projects. Access to those public building information should be no problem. However, access to private sector project might be difficult due to confidentiality.

Town Development and Market trends

- Development for housing is growing in recent years.
- Mostly housing is not built multiple dwelling, but individual housing.
- On housing sector, custom-built is few, built for sale is in general.
- Tendency of buyer is to buy their house in cash. (Not in loan)
- There is a large development company in private sector i.e. BAHRIA town and DHA etc.

Human resource development

- PEC is authorized to govern Professional Development of Engineers, bye-law, 2008.
- PEC joins International Professional Engineer Agreement (IPEA).
- 180,000 registered engineers in the country as of June 2014. (15,000 new members registering per year.

MEETING MEMO

Date	3 rd June, 2015	Time	11:00 to 12:00
Organization	Ministry of Science and Technology Venue: Ministry of Science and Technology, F-5/1, Islamabad		
Department	Ministry of Science and Technology		
Attendances	MOST: Muhammad Khalid Siddig – Joint Secretary Ashfaq Ahmed – Deputy Technological Adviser Ashtiaq Ahmad – Assistant Technological Adviser PNAC: Ismat Gul Khattak- Director General JICA: Mr. Imran Ahmad JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents	None		
Discussed			
<u>Presentation of summary of this project</u>			
<p>At the outset, JICA explained that JICA started the project regarding energy efficiency and conservation on building sector in Pakistan. This project is specifically aimed to gather necessary data in order to support energy sector reform.</p>			
<u>Submission and discussion of inception report</u>			
<p>JST submitted and explained key points of inception report to MOST. MOST indicated that they will support this project as much as possible.</p>			
<u>General suggestion from MOST (referring the last report issued by JICA)</u>			
<ol style="list-style-type: none"> 1. MOST suggested to interact with organization as below and offered to arrange meeting. <ul style="list-style-type: none"> ● National Institute Electronics (NIE) ● Pakistan Council of Renewable Energy Technologies (PCRET) ● Pakistan Council of Scientific & Industrial Research (PCSIR) 2. PNAC described frame work with respect to Pakistan standards. MOST emphasized importance of involvement of PSQCA. Any standards shall be examined by PSQCA, and notified as Pakistan Standards upon approval. 3. JST explained the idea of introducing Japanese labeling system for building energy-efficiency, and asked if PSQCA involvement is required for such system. MOST indicated that it should be certified by PSQCA if the system is intended to be used as “National Standard”. 			
<u>Improvement of Building Sector with respect to energy saving and environmental issue</u>			
<ol style="list-style-type: none"> 1. PNAC has been considering introducing GREEN BUILDING idea to Pakistan for building sector quality improvement. They are particularly concerned on wastage of energy and water. 2. JST explained general idea of Japanese Building Labeling System such as CASBEE and BELS. 3. JST also explained possible load map idea which is to start with voluntary building standard system with incentive, after enough understanding and appreciation by market, and then eventually adopt to mandatory standards 			

4. MOST noted that Pakistan Environmental Planning Architectural Consultant (PEPAC), under Ministry of Climate Change, has prepared report and recommendation regarding green building.
5. MOST mentioned that there is a project under cabinet direction; CDA is working on it, which is to make Islamabad as Green City.
6. MOST offered to arrange next meeting which will invite organization described in this meeting.

Going forwards

1. Next Meeting : 11:00, 15th June at MOST
2. JST to further research about Green Building activity in Pakistan.

MEETING MEMO

Date	4 th June, 2015	Time	12:30 a.m to 1:30 p.m
Organization	Ministry of Housing and Works (MOHW) Venue: Block - B, Secretariat, Islamabad		
Department			
Attendances	MOHW: Mr. Muhammad Irfan - Director General, National Housing Authority Mr. Sajjad Ahmed Bokhari - Dupty Director, National Housing Authority Ms. Nasim – Director, Civil Engineering ENERCON: Mr. Asad Mehmood - Technical Manager JICA: Mr. Imran Ahmad JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p><u>Presentation of summary of this project</u></p> <p>At the outset, JICA explained that JICA started the project regarding energy efficiency and conservation on building sector in Pakistan. This project is specifically aimed to gather necessary data in order to support energy sector reform.</p> <p><u>Presentation of inception report</u></p> <p>JST shared and presented inception report to Ministry of Housing and Works (MOHW).</p> <p><u>Access to date</u></p> <ol style="list-style-type: none"> 1. MOHW suggested contacting organization as below to correct the construction data. <ul style="list-style-type: none"> ● Capital Development Authority (CDA) ● Rawalpindi Development Authority (RDA) ● Lahore Development Authority (LDA) ● Association of Builders and Developers (ABAD) ● Defense Housing Authority (DHA) ● BAHARIA town (Private sector) ● Pakistan Social and Living Standard Measurement (PSLM) 2. MOHW owns some data for housing not for commercial. Data can be received via e mail. <p><u>Implementation of building code</u></p> <ol style="list-style-type: none"> 3. DG indicated that current implementation of Building Code of Pakistan (BCP) is not mandatory in practical point of view. Government projects could be controlled better, however for the private sector, it is not really ready to implement according to the BCP especially for smaller scale buildings. Large scale projects such as housing project for Defense Housing Authority (DHA) seems to be built in compliance with building code. 4. For building code compliance in general. There are many cases that actual construction has built not according to approved plan. In that case, as DG's position, architects and engineers are responsible for the building if any problem occurred. 5. Development Authority inspector does inspect buildings on site. However, the inspector's focus is if building has been constructed according to approved plan or not, particularly for floor area. Detailed such as material and equipments are not precisely inspected. Once inspection was approved, DA issues completion certificate. 		

6. In addition to DA inspector, for the government projects, independent inspection consultant is to be appointed who make sure contractor to follow specification and drawing.
7. DG mentioned that out of current Building Code, Seismic Provision is mandatory, however Energy Provision is not yet mandatory.
8. DG thinks education for engineers, architect, civil engineers, etc is the high priority in order to improve code compliance. He thinks that majority of those professionals may not even know the latest edition of BCPEP. There is a guidebook written in local language for Building Code of Seismic provision. However, for Energy Provision, no guidebook has been prepared.

Discussion for possible improvement and proposed ideas

9. JST explain the difference of Energy Conservation Evaluation System between Pakistan and Japan such as consideration of climate zoning and building usage which are not found in BCPEP.
10. JST further explained about idea of introduction of calculation method with user friendly software which will help to visualize energy efficiency indicator. This indicator can be used for further examination of cost saving for electricity bill. MOST is very interested in the idea and no objection to adopt Japanese system to Pakistan. DCE commented that it is very important to appeal to people's economic sense.
11. DG concluded that introduction of user friendly software is very interesting. This could be a project to improve both energy efficiency of building as well as skill of related professionals.
12. DG understands that if all building in Pakistan were compliance with BCPEP, it will save 30% of current energy consumption of building sector. DG will provide report or source of 30% saving base.

Post meeting discussion between DG and JST 16:00-16:15

13. Introduction of calculation method could be adopted into Continuing Professional Development (CPD) frame work in Pakistan.
14. In the next JST visit, DG could arrange a meeting inviting relevant organization in which JST can present possible idea for discussion. JST agreed in the idea and will prepare for the presentation material.

MEETING MEMO

Date	4 th June, 2015	Time	11:30 a.m to 12:15 p.m
Organization	Public Procurement Regulatory Authority (PPRA) Venue: Federal Bank for Cooperatives Building, G - 5/2, Islamabad		
Department			
Attendances	PPRA: Ms. Nazrat Bashir – Managing Director Mr. Ijaz Ahmed khokhar - Director ENERCON: Mr. Asad Mehmood - Technical Manager JICA: Mr. Ogasawara, Mr. Imran Ahmad JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p><u>Presentation of summary of this project</u></p> <p>At the outset, JICA explained that JICA started the project regarding energy efficiency and conservation on building sector in Pakistan. This project is specifically aimed to gather necessary data in order to support energy sector reform. Addition to this project, another project for improvement of Minimum Energy Performance Standard (MEPS) started at the same time in parallel.</p> <p><u>Presentation of inception report</u></p> <p>JST shared and presented inception report to Public Procurement Regulatory Authority (PPRA). JST consists of three experts on this project. Two experts will visit 3times until December this year, but one expert will stay Pakistan during six months in order to gather information timely. JST hopes that PPRA will prepare cooperatively necessary information for this project. As result of this project, JST will make suggestion to develop energy efficiency and conservation on building sector. Next project as second stage may be carried out based on such suggestions.</p> <p><u>Requested information to PPRA</u></p> <ul style="list-style-type: none"> ● JST required following information to PPRA, if it is available. <ul style="list-style-type: none"> ➤ Information of procedure of tender on governmental building construction works ➤ Tender documents on governmental building construction works in some sample cases ➤ Tender drawings on governmental building construction works in some sample cases ● As far as Tender Document for building is concerned, document and format prepared by PEC is adopted to PPRA procurement which is in line with PPRA frame work. ● There is no drawing kept in PPRA, those information should be available at other Development Authorities such as CDA. ● As far as building code goes, any project for federal government must follow federal government policy. <p><u>Idea from JST</u></p> <ul style="list-style-type: none"> ● JST explained possible ideas to improve energy conservation for building sector in Pakistan such as revision to building energy code, guidebook/ handbook to support implementation and labeling system. ● JST explained the idea of making government project with higher performance energy efficient building, and asked if it is possible to use PPRA procurement as a tool to enforce. PPRA is in agreement with the concept and do not see any barrier to do so. That will be up to procurement entity's policy. ● JST further explained that rather than doing high standard building in nationwide from the beginning, better to start from limited coverage, after enough recognition, and then spread into other provinces. PPRA is in agreement with the idea. ● PPRA mentioned that some kind of awareness seminar will be effective in addition to the idea of guide book / hand book. 		

Building energy code

- JST pointed out that current building energy code still regulation rules against componential parts of building, such as specification of glass of windows. JST Further emphasized importance to introduce benchmark indicator, comprehensive evaluation system of building which to be used for labeling.
- Labeling is to be used with incentives such as housing loan and tax exemption. Those ideas has been tested in Japan and was successful to improve energy saving.
- PPRA recommends that JTS to meet with Construction Technical Training Institution (CTTI) to see skill development. ■

MEETING MEMO

Date	4 th June, 2015	Time	9:45 a.m to 11:15 a.m
Organization	ENERCON Venue: ENERCON, G-5/2, Islamabad		
Department			
Attendances	ENERCON: Mr. Hassan Nasir Jamy - Managing Director. (additional secretary of MOWP) Mr. Noman Rafiq - Company Secretary, ECF Mr. Asad Mehmood - Technical Manager Mr. Muhammad Saleem - Chief of Agriculture and Admin. JICA: Mr Ogasawara, Mr. Imran Ahmad JST: Mr. Hagihara, Mr. Kurosaki, Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p><u>JICA プロジェクトの概要説明</u></p> <p>JICA 小笠原氏より、建築分野と省エネ普及促進の2プロジェクトについて、それらの概要説明がなされた。</p> <p>1. M/D をこれから (ENERCON の MD が) サインする。小さな修正を加えている。</p> <p><u>各プロジェクトのインセプションレポート説明</u></p> <p>Part 1: 省エネ普及促進</p> <ol style="list-style-type: none">ファイナンスに関しては、民間銀行は未だ何も知識がないという段階だろう。まずは State Bank of Pakistan (SBP) 話をするのがよい。そして、SBP から民間銀行に指示や依頼を出させるのが効率がよいと考える。最近 GIZ が Green Finance のセミナーを開催した。GIZ の活動は評価するが、2、3日だけ滞在しすぐ帰国する。本案件のように、じっくり腰を落ち着けて支援を提供してくれるのは大変ありがたい。啓蒙活動は大切である。本案件でも小さなワークショップなどを開催して欲しい。そこには商工会議所や配電会社も呼べばよいと考える。去年やったアンケート調査なども参考にして欲しい。低効率機器の市場からの排除もしっかりとやっていきたい。ENERCON の体制強化をするために、外部コンサルタントに体制案強化案を作らせようとしている。省エネ法の最終承認状況については、4段階の関門があるうちの2つが終わり、あと二つの関門突破が残っている段階である。7月から8月にかけて、これが完了することを期待している。(翌日アサド氏に確認したところ、あと4段階あると説明があった。「今は Last two steps」とアサド氏がこの会議で明言していたので、彼の話自身が矛盾していると考えるが、追求はしなかった。後日、じっくり確認したい。) <p>Part 2: 建築分野</p> <ol style="list-style-type: none">JST よりインセプションレポートの説明、ENERCON に対して電力に関連する情報の提供を依頼した。ENERCON はこれに合意し、今後詳細を確認する。		

2. 今後の PEC と ENERCON の役割分担の参考まで、前回の建築基準法（省エネ基準）策定時はプロセスをスピードアップするために ENERCON が MOHW, NESPAK, その他機関の承認取付のパイプ役となった。
3. 現状の建築基準法（省エネ基準）は大規模建築に省エネ基準の順守が課せられているが、ENERCON は次のステップとして、住宅分野への基準もしくはガイドラインを模索している。
4. 電力消費における商業施設、住宅の割合がわかるデータは無い。
5. Pakistan Green Building Council (PGBC)において、建物の省エネルギー関連の統計、データが集計されている可能性がある。PGBC では LEED を参照しているらしい。その他、institute of Architects in Pakistan からも情報を得られる可能性がある。JST にて今後フォローする。
6. JST より 既存建物調査の方針を説明した。3 地方、各種建物用途別、建物規模別にバランスよくサンプルを選択し、全体像をつかむのが目的であり、簡易的な調査する旨説明。ENERCON の建物の調査が必要であれば可能であるとの許可を得た。
7. 今後の電気需要の予測に関連して、開発のトレンドとしては住宅関連も強いが商業の需要が高まってくると予測している。イスラマバード、ラホール、カラチの主要 3 都市が強い。
8. MD からのコメントとして、カラチでは高層（10 階程度）のマンションが伸びている。夕方からの風が期待でき、エアコンを使わなくとも窓を開けることで快適に生活できるのが人気の理由ではないか。ラホールではそれほど高層マンションは伸びていない。イスラマバードでは F11 地区に高層マンション（7-10 階）が多く建ち始めている。
9. MD からのコメントとして、国外からの EXECUTIVE が住宅を探す場合は会社が費用を負担することも関係するが、他の国の標準の品質を求められており、これら需要に答えた施設が建設されてきている。高品質の住居には空調完備、各種電器が使用されることから電力消費は大きくなり続けている。
10. パキスタンの電力契約の構造としては契約容量による料金帯の種別その他、ピーク時の単価を高く設定する等の工夫をしている。詳細は追って JST に資料を提供する。
11. MD からのコメントとして、ENERCON では省エネルギーキャンペーンの一環として新聞掲載予定であることの情報提供があった。空調の設定温度を 26 度に設定するなどメッセージを掲載すること。ホテルなどの用途に関わらず、一律の温度設定を推奨する。JST から、日本の推奨温度設定は 28 度、その他クールビズ、ウォームビズという考え方があることを紹介。
12. JST から日本の省エネ法では一定以上の電力消費をしている場合はエネルギー管理者を置き、定期報告することが求められている管理者は関係者を教育する義務があることを紹介した。ENERCON からパキスタンでも同様の管理者を任命するという案があることの説明があった。
13. MD からのコメントとして、パキスタンにおいて住宅、商業等では、自ら直接電力会社に支払うために電気料金の節約のために各自が工夫をしているが、政府関連の施設では節約の意識が欠ける傾向がある。
14. MD からのコメントとして、ENERCON において建築基準法（省エネ基準）の運用の目的にハンドブックを作成するという動きがあり、作成のためのコンサルタント募集をしているが、いまだ決定していない。JST もハンドブックの必要性は感じており、今後詳細を確認する。

MEETING MEMO

Date	5 th June, 2015	Time	11:00 a.m to 12:00 a.m
Organization	Capital Development Authority (CDA) Venue: Capital Development Authority, Islamabad		
Department			
Attendances	CDA: Mr. Shahid Sohail – Member Engineering, Board member Mr. Waseem Ahmad Khan – Member Planning & Design, Board member Mr. Zahid Sultan – Director Building Control JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p><u>Presentation of summary of this project</u></p> <p>At the outset, JST explained that JICA started the project regarding energy efficiency and conservation on building sector in Pakistan. This project is specifically aimed to gather necessary data in order to support energy sector reform.</p> <p><u>Presentation of inception report</u></p> <ol style="list-style-type: none"> JST shared and presented inception report to Capital Development Authority (CDA). JST explained that JST consists of three experts on this project. Two experts will visit 3times until December this year, but one expert will stay Pakistan during six months in order to gather information timely. JST hopes that CDA will prepare cooperatively necessary information for this project. JST explained that JST will make suggestion to develop energy efficiency and conservation on building sector, as result of this project. Next project as second stage may be carried out based on such suggestions. <p><u>Power and role of CDA on building sector</u></p> <ol style="list-style-type: none"> Mr. Waseem explained that CDA has two roles on building works, one is performer on public works of metropolitan government, another is regulator against both private sector works and public sector works. Every participant on building works in CDA must be registered on specified list of CDA. This is separate system against registration of Pakistan Engineering Council (PEC). <p><u>Procedure of new building construction</u></p> <ol style="list-style-type: none"> Mr. Waseem explained that anybody who wants to build house in Islamabad shall get certification in two stages. Such policy is the same as Japan. First one is drawings certification, and drawings shall be submitted to CDA prior to start of construction work. CDA may give approval after checking compliance with CDA building code. Second one is completion certification, after completion of the construction work, the building shall be checked compliance with CDA building code again. Larger scale building may have more inspection during construction. Required Permit drawings are Architectural, Structural drawing and list of participated consultants. CDA inspector shall inspect on site if construction is as per approved design. In case of non-compliance, CDA is entitled to order the correction. <p><u>CDA building code</u></p> <ol style="list-style-type: none"> CDA confirmed that CDA building code exists apart from national building code, but it is in line with policy of national building code. 		

2. Three type of CDA building code, residence, commercial, public building (e.g. hospital) exists.
3. BCPEP (Energy Provision) has not been adopted by CDA. So current permit procedure does not consider compliance of BCPEP. However, CDA is considering adaptation in near future.
4. There is fire code which is regulated by other authorities. This is mandatory in high rise building. The definition of “high rise” is more than 4 storey.
5. All above procedure applies to both public and private buildings.

Procedure of formulation of CDA building code

1. Mr. Waseem explained that CDA prepares CDA building code in house by staff (Planning & Design department) of CDA. Prepared code is approved by board of CDA, is issued by CDA.
2. JST required CDA to share legal evidence of mentioned procedure.

Barriar that CDA is facing at the moment

1. Illegal construction
2. Illegal change of land use: Many illegal land usage which is against Islamabad zoning plicy.
3. Planning of zone 4 and 5 where many slam area are existing. Many unchecked building

Other information

1. Land price in central Islamabad: 70 mil PKR/ 500sqy
2. Land price outside of Islamabad: 5-10 mil PKR/ 500sqy
3. Green Project is the ongoing project.

Documentation to be obtained

JST requested documentation listed as below. CDA permits and will provide in hard copy.

1. Organization chart including number of staff.
2. CDA building code (Includes all pdf document available in WEB since those download was not working well)
3. CDA building application form and list of drawing/ specification
4. Any check list used by building inspector
5. Legal evidence of procedure of formulation of CDA building code.

MEETING MEMO

Date	8 th June, 2015	Time	14:00 to 14:30
Organization	ENERCON Venue: ENERCON, G-5/2, Islamabad		
Department			
Attendances	ENERCON: Mr. Asad Mehmood - Technical Manager JST: Mr. Hirooka		
Obtained Documents	<ol style="list-style-type: none"> 1. Compliance Handbook –Building Energy Code of Pakistan-1990 2. Design Manual Energy-Efficient Buildings in Pakistan 3. Energy Efficient Housing – Improvement of Thermal Performance of RC Slab Roofs- November 2010 4. Pakistan Solar Architecture 		
Discussed	<p><u>History of Building Code of Pakistan Energy Provision</u></p> <ol style="list-style-type: none"> 1. There was a Building Energy Code of Pakistan issued in May 1986 under MOHW, prepared by ENERCON which includes climate zoning consideration. However, there is no consideration on windows/ glass. 2. The hand book for above was created in 1990. 3. The idea of revision to above was raised during ACE campaign (Awareness Campaign of Energy Conservation and Environment) which was carried out from 2003 to 2010 and extended to 2012. 4. NESPAK was selected for revision for Building Energy Code, however for some reason, deliverables were not submitted in time. Eventually contract with NESPAK was terminated. 5. After that, ENERCON decided to engage with PEC so that Energy code to be adopted in the existing Building Code of Pakistan frame work. 6. After the participants effort, Building Code of Pakistan Energy Provision has been notified as SRO in 28th March 2013 7. Launching Ceremony was held on 13th Feb 2014. <p>Other</p> <ol style="list-style-type: none"> 1. JST reported that MOHW mentioned BECEP is not mandatory, CDA indicated they have not adopted BECEP. ENERCON pointed out the adoption clause of BECEP. JST will further clarify with PEC regarding this issue. 2. JST asked reason why climate zoning consideration was not adopted into latest edition of BECEP. ENERCON has asked same question to participant, the reason seems to be in relation with ASHRAE standards. JST will further clarify. 3. Tariff Structure is available at MOWP. JST will follow up. 4. ENERCON provided report of Energy Efficient Housing Project under support of UN Habitat, in which improvement of thermal performance of RC slab roofs are introduced. 5. ENERCON provided soft copy of relevant document. However Building Energy Code was not included. ENERCON to provide them. 		

MEETING MEMO

Date	8 th June, 2015	Time	15:30 to 15:30
Organization	TOBISHIMA CORPORATION Venue: ENERCON, G-5/2, Islamabad		
Department			
Attendances	TOBISHIMA: Mr. Hiromi Samejima – Senior Advisor JST: Mr. Hirooka		
Obtained Documents	1. Tobishima Company Profile 2. 現地普及の断熱材資料		
Discussed	<p><u>現地一般工法</u></p> <ol style="list-style-type: none"> 1. RC造が主流でS造は工場のみ。RC ラーメンに煉瓦もしくはコンクリートブロックによる壁を立ち上げる。 2. イスラマバード、ラホールは煉瓦が主流 (w228xd114xh75) 外壁は W228 にプラスタ一塗が多い。カラチでは煉瓦の代わりにコンクリートブロックが採用されることが多い。W400,H200 に厚みは数種類ある。(D200,150,100) 3. 外壁への断熱材はしないのが主流。屋根に関しては断熱するのが一般的。数年前までは断熱材といえば発泡スチロールしか手に入らなかったが、ここ 2-3 年でスタイロフォーム (日本で一般的) が手に入るようになってきた。屋根においてはスラブ上に防水して、断熱材敷き込の上押さえコンクリートとする。押さえコンクリートの上にさらに下駄状の仕上げをして仕上材とコンクリートの間に空気層を持たせる工法もある。工場ではグラスウールを使用した工法その他、サンドイッチパネルなども採用した事例がある。 <ol style="list-style-type: none"> A) 発泡スチロール価格 <ol style="list-style-type: none"> ① t=50mm 厚 Rs.160-/m2 ② t=25mm 厚 Rs. 80-/m2 B) スタイロフォーム <ol style="list-style-type: none"> ① t=50mm 厚 Rs.1,015-/m2 ② t=25mm 厚 Rs. 520-/m2 4. 役所もしくは PWD には標準納まり詳細があるのではないか。→フォロー 5. サッシ: 現地工法は窓開口をプラスタ一仕上げした後に窓フレームを切りながら設置している。躯体との気密・水密性能が良くないため、飛島建設ではコーキング処理を標準としている。サッシに関しては ALCOP というメーカーをよく使用する。 6. ガラス: 2重ガラスも出始めているが、主流は単板ガラスの 5 mm。色つきガラスは良く日射を抑える目的で良く使われている。(飛島建設が入居するオフィスビルは 2重ガラス) 		

7. 空調機：日本のダイキンはパキスタンではメンテが出来ないため販売していないが、ダイキンが技術協力しているマレーシアの空調メーカー名、ACSON、MCQUAY でパキスタンに普及、省エネタイプもある。(電圧調整、必要な時にコンプレッサ稼働) その他パキスタンでは三菱製その他、中国メーカーの技術支援でパキスタンで組み立てを行っている haier、orient のシェアが多い。
8. 照明器具：パキスタンの照明器具は「フィリップス」(台湾、中国から輸入) および「クリプソン clipson」(オーストラリア) が多くシェアを持っている。LED ランプが市場に普及し始めているが、おそらくタイ、中国からの輸入品が多い。
9. 換気：全熱交換器はパキスタンで採用されたという事例は聞いたことが無い。

現地技術者、建築行政に関して

1. 設計者、エンジニアは海外の大学卒も多く、技術的にも問題ない。
2. CDA は現地の建物位置出し時に検査に来るという話を聞いたことがある。
3. 2005 年の地震でイスラマバード F10 で建物が倒壊し、CDA はメディアでたたかれた経緯があり、CDA は構造の審査に関しては意識を高く持っている。
4. 各建築行政独自の条例の他、大規模団地等 (BAHARIA,DHA) においても独自の基準を設けている。→JST にて資料収集予定
5. 防災関係はパキスタンには現状細かい基準が無いいため、設備設計者はアメリカの npfa の基準を採用している。

コスト関連

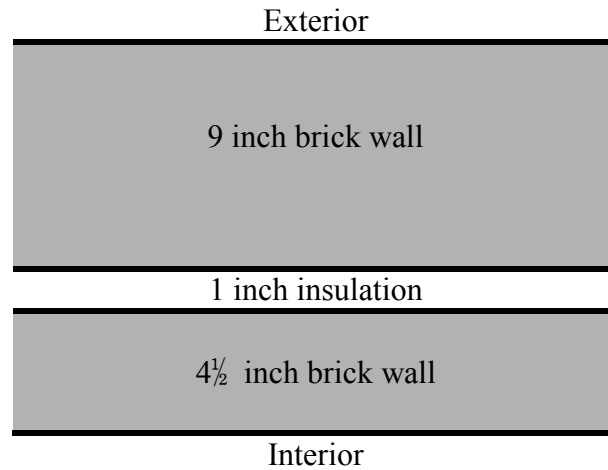
1. 無償案件単価 (学校：180,000/m² / 病院：200,000/m²/工場：130,000/m²)
2. 現地住宅レベルの建設単価 (3-50,000 m²)
3. 人材 (建設労働者 600-1000PKR/ day, 大卒技術者 100,000PKR/ month) 近隣諸国では 1,500 USD/ month

MEETING MEMO

Date	9 th June, 2015	Time	16:00 to 17:00
Organization	Baharia Town Venue: Customer Support Center, Baharia Town, Rawalpindi		
Department			
Attendances	Baharia Town: Mr. Usman Illahi- G. M. Sales & Ops Ms. Amreena Asif- Chief Architect JST: Mr. Hirooka		
Obtained Documents	1. Master Plan Drawings 2. Season's Greetings book -2015-		
Discussed	<p><u>Meeting with Sales agent</u></p> <ol style="list-style-type: none"> 1. Product created by Baharia Town is to be sold to end user through authorized dealer. 2. Standard purchasing procedure is as below. <ol style="list-style-type: none"> A) 25% down payment by buyer after signing contract. B) Building Contractor start construction. C) Buyer to pay remaining payment in every 3 month divided by agreed payment period. Standard payment period is 1-2 years. There is a package in Karachi which allows 4 years payment period. D) Upon completion of payment, building to be handed over to the buyer. 3. Housing loan is not popular in Pakistan due to the high interest rate. 4. Sales Price <ol style="list-style-type: none"> A) High-end: 40mil PKR for 500-600 yard² (418-500m²) B) Middle range: 7-8 mil PKR for 200 yard² (167 m²) C) Low-cost product: 0.5 mil PKR for 75 yard² (62.7 m²) 5. Reasons being successful <ol style="list-style-type: none"> A) Trust on delivery. (Building contractor does not run away.) B) No electrical load shedding by back-up generator. (However, electricity unit cost is higher than grid power.) Note: BahariaTown is the only private housing society in Pakistan to have obtained license from NEPRA, National Electric Power regulation Authority, to distribute electricity to its residents. C) High Security. (Gated town with own security force patrolling system) <p><u>Meeting with Chief Architect</u></p> <ol style="list-style-type: none"> 1. Most of the building designs are custom design based on the client requirement. Built and Sale package is not common in individual housings. 2. Standard design criteria do not consider BCP-EP-2011 or other EE&C standards at this moment. (BCP-EP-2011 の存在すら知らなかった。) 3. There are a few clients who are willing to invest initial cost for EE&C for the building design. 		

In percentage, 2-3% of client is keen to consider EE&C. So architect normally do not propose EE&C to client.

4. Standard exterior wall is 9 inch brick wall. In case of EE&C consideration, 1 inch insulation and 4½ inch brick wall to be added internally. This is the significant impact in cost as well as area reduction.



5. Numbers (Residential division in Islamabad)
- A) 4,570 houses have been built in Baharia Town in last 10 years.
 - B) Currently, in average of 80 houses per month completing.
 - C) Total 8,400 houses has been permitted for construction. This number includes 4570 houses completed, so there are about 4000 houses listed as approved design but un-built so far.

Note: Above mentioned price and figures has not been confirmed by other source. JST to further investigate.

MEETING MEMO

Date	9 th June, 2015	Time	17:00 to 17:30
Organization	Land Mark's Venue: Phase-VIII, Baharia Town, Rawalpindi		
Department			
Attendances	Baharia Town: Mr. Majid Ali- CEO Mr. Muhammad Ali JST: Mr. Hirooka		
Obtained Documents			
Discussed	<p><u>Introduction</u></p> <p>Land Mark's is an authorized real estate agency/ builder for Baharia Town. Main objective is to build and sale individual housings in Baharia town.</p> <p>JST introduced primary purpose of the survey and requested standard consideration with respect to the EE&C from builder's point of view.</p> <ol style="list-style-type: none"> 1. One of the strong sale point of Baharia Town is the own power generator. 2. Some owner request to install solar energy water heater installed on the roof. 3. Standard lighting fixture is CFL, however if client wishes, LED light are also available. (imported from China) 4. Standard consideration for EE&C <ol style="list-style-type: none"> A) Roof A: Suspended ceiling under roof slab. 9-12 inch of space between ceiling and roof slab will control heat transmission to living environment. (No insulation material) B) Roof B: in addition to above, on top of the water proofing, provide 3-4 inches of mud with finish material. (Mud seems to be cheaper solution compare to insulation material) C) Wall: Especially for west wall, back coal tar epoxy paint is often used for both water proofing and heat protection. 5. Optional consideration for EE&C <ol style="list-style-type: none"> A) Use double glazing for windows. (about 5% client only) B) Use tinted glazing for windows. C) Cost comparison: (Clear glass=400PKR/ft², Tinted glass=500PKR/ ft², Double clear glazing=1000 PKR/ft²) 6. Air Conditioner: Sprit type is common in housing. Many clients choose heating/ cooling type. 7. In the larger scale of office and retail project, central system is becoming popular. 8. Decision maker for the building specification is the client. 9. Major project scales for Land Mark <ol style="list-style-type: none"> A) High-end: 40-50 mil PKR houses B) Low-end: 9 mil PKR houses <p><i><u>Note: Above mentioned price and figures has not been confirmed by other source. JST to further investigate.</u></i></p>		

MEETING MEMO

Date	9 th June, 2015	Time	9:00 to 10:00
Organization	Sustainable Technologies Venue: Ramada Hotel, Islamabad		
Department			
Attendances	Sustainable Technologies: Mr. Muhammad Asif Khan JST: Mr. Hirooka		
Obtained Documents	1. Building Energy Code of Pakistan 1990 2. The Code Compliance Handbook		
Discussed			

Introduction

Mr. Asad of ENERCON introduced us Mr. Muhammad Asif Khan who was hired as local consultant for GIZ project in Islamabad 2008-2010.

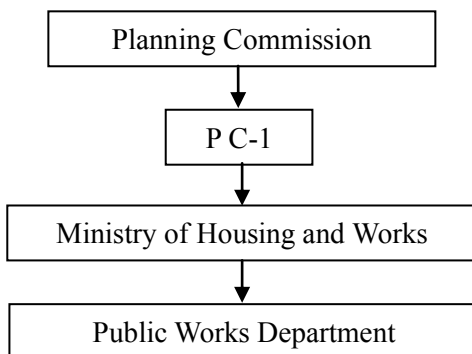
Energy Efficiency Consultant with GIZ Islamabad 2008 to 2010

Pilot project for Energy Efficient Appliances to improve the energy consumption of appliances like fans, washing machines and lights. Studied standards of efficient appliances and rating system. Implemented Institutional Capacity development for institutions responsible for appliance testing and approvals. Evaluated testing facilities.

The Key aspect to improve government projects

1. JST briefly explained about findings of current status of Building Code of Pakistan Energy Provision 2011 (BCP-EP-2011) by meeting with relevant authorities.
2. ST noted that Policy maker for government project is Planning Commission under the Ministry of Planning and Development. If government project policy is to be revised, it shall be notified by Planning Commission.
3. Each project policy shall be described in PC-1 form and approved by Planning Commission. If PC-1 form states BCP-EP-2011 compliance, it should be managed by MOHW as well as PWD accordingly.

Image diagram



Other

1. ENERCON has managed energy audit project, 50 government buildings. →JST to follow up.
2. As a private sector town development, Baharia Town is proposing LIFE STYLE to public and very successful. Their sales points are;
 - A) Own power generator
 - B) Own solar panel system
3. Defense Housing Authority (DHA) has own policy of town planning.
4. Successful product will be copied by other developer and may become standard in this country.

MEETING MEMO

Date	10 th June, 2015	Time	3:00 p.m. to 4:00 p.m.
Organization	Karachi Metropolitan Corporation (KMC) Venue: Gulshan Iqbal, Civic Center, Karachi		
Department			
Attendances	KMC: Mr. Nasir Abbas - Director (Land) Mr. Saleem Ahmed Zahid - Additional Director Land Management. JICA: Ms. Sasabe JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Sharing and presentation of inception report.</u></p> <p>JST presented the inception report of this survey and also explained back ground, objective, schedule, member of the survey.</p> <p><u>Power, functions and role of KMC on building sector in Karachi</u></p> <p>JST asked role and power that KMC has on the building sector, after citing CDA acts performer and regulator.</p> <p>Additional Director (AD), KMC informed that KMC does not deal implementation of building codes in Karachi rather it deals with regards to create and approve piece of lands in the Karachi for constructions of residential buildings, commercial buildings, industrial buildings etc. AD further stated that implementation of building codes in Karachi is under the jurisdiction of Sindh Building Control Authority (SBCA).</p> <p>AD stated that SBCA is the regulator which regulates the building bylaws in Karachi for construction of residential, commercial, and industrial buildings.</p> <p><u>Procedure of new building construction</u></p> <p>As mentioned above, KMC do not concern with any procedure on building construction, so this item was skipped.</p> <p><u>KMC/KDA building code</u></p> <p>As mentioned above, KMC do not concern with such code, so this item was skipped.</p> <p><u>Procedure of formulation of KMC/KDA building code</u></p> <p>As mentioned above, KMC do not concern with procedure of such code, so this item was skipped.</p> <p><u>Barrier that KMC/KDA is facing at the moment</u></p> <p>As mentioned above, KMC do not concern with topic, so this item was skipped.</p> <p><u>Meeting schedule with SBCA</u></p> <p>After going through the Agenda and presentation of the inception report, AD suggested the JST to approach SBCA for collecting information on energy efficiency and conservation in the building sector of Karachi.</p> <p>Meeting with SBCA has accordingly been fixed which will be held on 11-06-2015 at 9:15 at the Office of SBCA for discussion of the Agenda.</p>		

MEETING MEMO

Date	10 th June, 2015	Time	12:00 to 12:45
Organization	Ministry of Housing and Works (MOHW) Venue: Block - B, Secretariat, Islamabad		
Department			
Attendances	MOHW: Mr. Muhammad Irfan - Director General, National Housing Authority PWD: Mr. Shah Din Sheikh – Director General (by last May 2015) JST: Mr. Hirooka		
Obtained Documents			
Discussed	<p><u>DG-MOHW comments on meeting memo dated 4th June</u></p> <ol style="list-style-type: none">DG indicated that Building Code of Pakistan- Seismic Code-2007 (BCP-SC-2007) and Building Code of Pakistan-Energy Code-2011 (BCP-EP-2011) to be clearly stated.DG emphasized that BCP-SC-2007 is mandatory. All relevant Development Authority is responsible for the compliance of BCP-SC-2007. DG also stated that BCP-EP-2011 is not mandatory. <p><u>BCP-EP-2011 implementation status</u></p> <ol style="list-style-type: none">JST referred the preface page of BCP-EP-2011, which states adaptation to the BCP as enforcement by S.R.O. DG noted that in spite of S.R.O., from the practical point of view, BCP-EP-2011 is not yet ready for proper implementation.Former DG of Public Works Department (PWD) stated that BCP-EP-2011 is not yet considered as mandatory requirement in public work building design. All federal government projects are designed under control of PWD, drawing is submitted to CDA for review of code compliance.DG suggested that in order to fulfill the gap, following activity will be required.<ol style="list-style-type: none">Capacity DevelopmentAwareness DevelopmentGuidebook/ handbook to support implementation <p><u>Contact information for further interview to PWD if required</u></p> <ul style="list-style-type: none">● Mr. Ali Akbar Sheikh DG PWD 0300-2400023● Mr. Safdow Ali Chief Engineer Planning PWD (for Seismic provision)		

MEETING MEMO

Date	10 th June, 2015	Time	13:30 to 14:30
Organization	Institute of Architects Pakistan (IAP) Venue: Tuscany Courtyard, Islamabad		
Department			
Attendances	IAP: Mr. Jahangir Khan Sherpao- President JST: Mr. Hirooka		
Obtained Documents			
Discussed			
<u>Introduction</u>			
<p>Mr. Jahangir Khan Sherpao is the president of IAP as well as the member of Pakistan Green Building Council (PGBC).</p> <p>JST introduced primary purpose of the survey and requested sharing information with respect to EE&C consideration from architects point of view. JST also requested information regarding activity of PGBC.</p>			
<u>The Key aspect to improve EE&C in building sector</u>			
<ol style="list-style-type: none">1. IAP is aware that major barrier to improve EE&C is the education. There is a gap between the policy and ground reality.2. One of the major problems is the shortage of teacher for architectural course in University. There were 5-7 architectural courses in University 5 years ago. However there are currently 22 architectural courses in University and increasing to 30 Universities in near future.3. Architecture course is becoming very popular for students due to the high demand and salary in neighboring countries.4. Architectural course teachers are now becoming head of those architectural courses. They are struggling for shortage of skilled teachers. Teacher training is one of the highest priorities in the country.5. IAP has been making effort to filling gaps mentioned above.			
<u>Green Building Council</u>			
<ol style="list-style-type: none">1. PGBC was established 2 years ago in Pakistan. For the detail information of PGBC, Mr. Jahangir will arrange meeting with the president of PGBC who is in Lahore.2. Mr. Jahangir mentioned that under World Green Building Council, each country has its own design criteria due to the characteristics of region. However, US are promoting LEED for other countries consideration.3. JST noted that Japan has own labeling system under the WGBC. JST is also willing to discuss with PGBC for possibility of improvement of EE&C of building sector in Pakistan. Mr. Jahangir is open to the idea.			
<u>Design criteria</u>			
<ol style="list-style-type: none">1. Priorities for insulated envelopes are: Roof, South Wall and West Wall.2. Double glazing is available in the market.			

MEETING MEMO

Date	11 th June, 2015	Time	04:00 p.m. to 05:15 p.m.
Organization	Association of Builders and Developers (ABAD) Venue: ABAD House Gulistan-e-Johar, Karrachi.		
Department			
Attendances	ABAD: Mr. Hanif Memon- Vice Chairman, Mr. Hassan Bakhshi - Chairman (South Region), Mr. Syed Javed Jafri - Secretary General, Mr. Nadeem Farukh - Builder, Mr. Azeem Durani - Admin. Officer, Mr. Abbas Khan - Assistant Secretary, Mr. Hanif Memon- Vice Chairman, Mr. Abdul Karim Adha - Builder, Mr. Mustafa Saikhani - Builder JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. ABAD Annual Report 2013-14, ii. ABAD shelter (bimonthly magazine published by ABAD)		
Discussed	<p><u>Sharing and presentation of inception report.</u></p> <p>JST presented the inception report of this survey and also explained back ground, objective, schedule, member of the survey.</p> <p><u>Vision, Scope and activities of ABAD:</u></p> <p>JST asked activities of ABAD.</p> <p>1) Introduction of Association of Builders and Developers (ABAD)</p> <p>Chairman, ABAD introduced that ABAD is a national level representative organization of Builders and Developers, registered under the Companies Ordinance, 1984 with Registration NO. Karachi No.4967 of 1977-78 and licensed under Trade Organizations Ordinance 2007-2013 and its affiliated with the Federation of Pakistan Chamber of Commerce and Industry (FPCCI). It was formed in 1972 with the aims and objectives of unifying and streamlining the constructions activities of private sector.</p> <p>2) Aims and objectives of ABAD</p> <ul style="list-style-type: none"> • Unifying builders and developers for their collective aims and objectives. • Promoting housing industry in the country. • Providing assistance to the government in formulating its housing policies and plans. • Coordinating among the government, ABAD members and other agencies of. • Dealing with problems faced by its members in the execution of their projects. • Organized research. • Awareness and training programme to promote the technology and art of building. • Working actively for eradication of unethical business practices from the housing and developing field. 		

- Exploring the prospects of large-scale projects in the public sector and then acting as a consortium of ABAD members to secure and execute the projects.

3) Members of ABAD

Chairman further discussed and informed that today, ABAD has its fold more than 1,000 leading construction companies of the country.

Capacity development of ABAD.

JST asked capacity development of ABAD.

Chairman informed that ABAD has builders/developers for constructions of the all kinds of buildings with modern technology.

Number of Buildings:

JST asked number of buildings in Pakistan, province wide also.

Chairman said that data regarding the buildings in Pakistan is the sole responsibility of government of Pakistan, but unfortunately government does not have such data. ABAD does not have such data of the buildings in the entire Pakistan. He, however, stated that they can research it in order to know such information if it is required.

Material of building

JST asked Specification and main player of building material, i.e. roof, wall, windows, in general in Pakistan.

Chairman ABAD stated that they are using the following materials for construction of the buildings:

- i. **Roofs:** Concrete 6-8`` thick. Low cost for 4``.
- ii. **Walls:** Walls are of bricks/blocks 4-8`` depending on the drawing.
- iii. **Windows:** Aluminium (reasonable cost) and Wooden (expensive)
- iv. No insulation is being used in Sindh due to moderate climate of the Karachi.
- v. **Aluminium companies :** They are using Japan metal and SINO Pak metal.

Building Equipment.

JST asked Specification and main player of building equipment, i.e. air condition, ventilation, lighting, hot water supply, in general in Pakistan.

1) Air conditioner

Chairman stated that central air conditioning system is only being used in the following buildings in Karachi.

- i. Five star hotels
- ii. shopping malls
- iii. Few commercial office building

While other buildings use individual air conditioning subject to need. All air conditioning is being used on electricity even though it is expensive, but people are using it. He further stated that there is a company named KAAF Engineering that installs air conditioning chillers imported from other countries i.e. Japan,

China and Korea.

As per their information, following company's ACs are being used in Karachi:-

- i. PEL
- ii. Haier
- iii. Orient.
- iv. Mitsubishi
- v. LG
- vi. Samsung
- vii. Gree
- viii. Kenwood

2) Ventilation system

JST asked ventilation system on the buildings in Pakistan.

ABAD informed that two types of ventilation, mechanical ventilation and natural ventilation, are adopted in general. The former is installed in the high rise buildings, while the latter is built in the residential buildings.

3) Lighting

Chairman informed that recently they have started using energy saver fluorescent lamps and LED lights and inverter ballasts. So far automatic light control with sensor is not introduced in common in Pakistan.

- i. Philips
- ii. Sogo
- iii. Siemen

4) Hot Water Supply

Hot water is usually supplied by the Gas water heater.

Situation of Compliance with building code of Pakistan energy provision

JST asked recognition to Building Code of Pakistan energy provision (BCPEP) in ABAD member, barriers also.

1) Recognition to BCPEP

Chairman stated that ABAD does not know about the building code introduced by Pakistan Engineering Council in the year 2013. No member of ABAD is following these codes in Karachi.

2) Barriers for implementation of BCPEP

Chairman ABAD stated that they are not familiar with BCPEP and if government wants ABAD to implement such codes, the following barriers should be removed:

- i. Government should give recognition to the contractors, builders and award them extra F.A.R.
- ii. Government should give incentives for adoption of these codes.
- iii. Campaign at large level needs to be started so that contractors, and public at large could be familiar with these codes.
- iv. Public awareness campaign is major tool in order to make building codes (energy provision)

familiar with public.

3) Support of ABAD

Chairman stated and assured the JST that ABAD is always available for such a national cause if the government intends to adopt such codes, and the government should approach them.

- i) The JICA should support a private building in order to create a model.

Discussion for JST rough idea

JST shared the document named “Brief presentation of rough idea on this survey at present” to ABAD, and JST requested ABAD to share their opinion regarding the document. Chairman assured to look into this matter and they will send their opinion/suggestion by email.

Arrange for site visit

As per request of JST, ABAD arranged site visit against 2 collective buildings, one was under construction, another was at almost completion.

MEETING MEMO

Date	11 th June, 2015	Time	09:15 p.m. to 11:30 p.m.
Organization	Sindh Building Control Authority (SBCA). Venue: Hussain Square, Civic Center, Gulshan-e-Iqbal, Karachi.		
Department			
Attendances	Sindh Building Control Authority (SBCA): i. Khawaja Muhammad Badiuz Zaman - Consultant/Director (TP), ii. PLNR. Nadeem Ahmed Khan - Director, iii. Engr. Ali Mehdi Kazmi - Director, iv. Eng. Ali Ghufraan - Director and v. Arif Kasam Mysorewala – Structure Engineer. JICA: Ms. Sasabe JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. The Karachi Building & Town Planning Regulations, 2002, Edition 2014 (booklet), ii. The Sindh Buildings Control Ordinance, 1979 and Karachi Building Control Licensing Regulations, 1982 and The Sindh Regulation and Control (Use of Plots & Construction o Buildings) Ordinance, 2002 & the Rules, 2002 (booklet), iii. The Sindh High Density Development Board Act, 2010 with (Rules & Procedure), 2011 (booklet), iv. Sindh Building Control Authority (Printed Power Point) v. Check list of architectural presentation For S.B.C.A. presentation committee (printed sample), vi. Karachi Building Control Authority (Gulshan Town) Scheme No.-33 (Printed sample), vii. Receipt issued to Owner on submission of Proposed Building Plan at SBCA Counter (SAMPLE PERFORMA).		
Discussed			

Sharing and presentation of inception report.

JST presented the inception report of this survey and also explained back ground, objective, schedule, and members of the survey team on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting.

Power, functions and role of SBCA on building sector in Karachi

JST asked role and power that Sindh Building Control Authority (SBCA) has on the building sector, after citing CDA acts performer and regulator.

1) Introduction of SBCA.

Karachi Building Control Authority establishment under Sindh Building Control Ordinance-1979 and on 14th February, 2011, that the Government of Sindh extended the area of Karachi Building Control Authority (KBCA) to whole of the Province of Sindh with Headquarter at Karachi. It was renamed as Sindh Building Control Authority (SBCA) work under Karachi Building and Town Planning Regulations-2002 (hereinafter referred to KBTP Regulations). Now SBCA has its regional offices in following cities of Sindh Province:

- i. Karachi - Headquarter,
- ii. Regional Office, Hyderabad,
- iii. Regional Office, Mirpurkhas,
- iv. Regional Office, Sukkar,
- v. Regional Office, Larkana.

2) Power and role of SBCA on the building sector in Sindh Province

SBCA authorities informed the role and functions, which are given below:

- To regulate Town Planning & Building Control under SBCO, 1979.
- Approval of all categories of Building Plans.
- Issuance of NOCs for Sale & Advertisement.
- To resolve complaints against Public Sale Projects.
- To take action against the builders/individuals of violation of approved building plan.
- To identify, declare and demolish the dangerous buildings.
- Issuance of license to Professionals (Architects, Engineers, Structure engineers, Town planners), Builders and Developers.
- Heritage Buildings-Coordination with the Department of Culture, Government of Sindh for their assessment and preservation.
- Height Control around Mazar-e-Quaid.
- Takes action against the unauthorised construction.
- SBCA Karachi Region maintains a full-fledged demolition squad.

- The demolition functions are being monitored very closely, through before & after demolition duly by photograph.

3) Achievements of SBCA

Following achievements, SBCA maintains:

- It has declared 'No Limit Zone/High Density Zone' in Karachi.
- Establishment of independent SBCA Court and Magisterial Power to the officers of SBCA are with the Government of Sindh.
- Establishment of SBCA Police Station.
- Facilitate the matters of Association of Builders and Developers (ABAD) under provision of SBCO, 1979.

Situation/confirmation of implementation of building codes by SBCA.

SBCA stated that SBCO (Sindh Building Control Ordinance-1979), authorized the SBCA to make rules & regulations for buildings whenever is required. SBCA has their own building Regulations known as KB&TP Regulations. Therein four categories of buildings have been explicitly defined as shown in Table 3.1 of KB&TP Regulations. Details of such categories is given below:

Category-I	a) Bungalow on plot up to 120 Sq. Yds. (100.33 Sq. m) b) Any other building on plot upto to 120 Sq. Yds. (100.33 Sq. m) with height upto to 33 ft. (10 m).
Category-II	a) All bungalows. b) Any other building with total floor area upto 20,000 Sq. ft. (1858.74 Sq. m) and/or height upto 50 ft (15.2m), other than Category I & IV.
Category-III	All buildings with total floor area greater than 20,000 Sq. ft. (1858.74 Sq. m) and/or height greater than 50 ft. (15.2 m), other than Category IV.
Category-IV	Public use buildings or Industrial buildings with total floor area more than 10,000 Sq. ft (929.36 Sq. m) or with span more than 40 ft. or ground floor height more than 15 ft., building for essential facilities and public sale buildings.

Procedures for new building constructions/approval of building construction.

JST asked to know about submission of buildings plan for approval.

SBCA informed that as per KB&TP Regulations, the owner shall submit to authority necessary documents which have been mentioned in the Chapter 3 and section 3-2.2 of KB&TP Regulations.

1) Procedure for approval of building construction

As per Table 3.2 of KB&TP Regulations, approval procedure has been defined respectively due to each categories as mentioned:

S.No	Category	Plan signed by professional	Approval granted
1.	I	Building Designer Or Architect or Professional Engineer (Civil) or Structural Engineer	(One Stage) Final approval
2.	II	Architect and/or Structural Engineer	(One Stage) final approval
3.	III	Architect and Structural Engineer**	(Two Stage) Architecture approval submission of structural design/drawing for record (and vetting)**
4.	IV	Architect and Structural Engineer** submission of Plumbing and electrical drawings in respect of public sale buildings by relevant professionals through concerned Architects	(Two stage) Architectural Approval structural design and drawing duly vetted by Proof Engineer, Plumbing and electrical drawings duly signed by relevant professional.

2) Required document on application

As per section 3-2.2 of KB&TP Regulations, specified format and architectural working drawings/plans shall be submitted on application. Specified format requests signature of architects/building designer and Signature of engineer.

3) Inspection

As per section 3-2.12 of KB&TP Regulations, SBCA has power to inspect the premises without giving prior notice, at any time from submission of application to completion of construction.

KB&TP Regulations do not define specified format for inspection, but inspection is carried out through checking compliance with application.

SBCA should carry out inspection within 20 days from the receipt of the notice of completion or the occupancy certificate.

4) Establishment of SBCA Police Station

SBCA stated that for checks and monitoring of the implementation of KB&TP Regulations, they have their own police station which works on directions of Director General, SBCA supported by Demolition Section.

Building code for SBCA

JST asked existence of building code for SBCA and relevant information in detail.

1) Building code for SBCA

SBCA stated that they has own rule & regulation with reflected policy of national building code. But, it is not called building code for SBCA, just called rule & regulation (KB&TP Regulations).

2) Number of type of regulations

In addition to KBTP Regulations, the Sindh High Density Development Board Act, 2010 with (Rules & Procedure), 2011 exists which is special law.

3) Adoption of BCPEP

JST asked the adoption of building codes of PEC. They informed that in the year 2013, SBCA has adopted the Pakistan Engineering Council Code on Energy.

SBCA discussed and explained that SBCA has adopted certain measures/procedures through which they are conserving energy. Under chapter 9, SBCA ensures the following measures for construction of residential buildings, commercial buildings, staircases, lifts, places of assembly and godowns and warehouse:

- Space requirements in and about building.
- Method of measuring minimum clear space.
- Separate approach for every building.
- Projections beyond property limits.
- Allowable projects.

4) Lighting and Ventilation regulations mandatory provision by SBCA

SBCA has its lighting and ventilation regulations and these regulations ensure the following in true letter and spirit:

- Size of external opening.
- Size of internal openings
- Internal Air wells.
- Permanent openings in Kitchen.
- Water closet, wash room.
- Garages.
- Staircases
- Mechanical ventilations and central air conditioning waiver & minimum requirement.

5) Licensing/Enlistment of Professionals

SBCA in KBTP Regulations (Chapter-4) has specifically mentioned the qualification/criterion for providing license/enlistment of professionals which states that a person registered as structural engineer with KBCA/SBCA and having minimum 10 years experience in the relevant filed and member of the faculty having rank of Professor n HEC approved institutions, who full the above condition of experience.

Category	Qualification/Experience	Entitlement
'A'	Registered Structural Engineer with KBCA, possessing a M.Sc (Structure) & having 15 years of relevant experience & clearance of proficiency test.	All Commercial, Residential Buildings, Hospital & Educational Institutions & any other special type of structure.

6) Building structure design and construction requirements in Sindh Province

As per Chapter-11 of KBTP Regulations, following requirements mandatory for building structure design and construction:-

- Engineering Design of building.
- Sub soil investigation

- Wind Load
- Erection on reclaimed site.
- Protection of existing services
- Foundation near drains
- Specifications
- Testing of materials
- Supervision and
- Ready mixed concrete from batching plant.

7) Residential density requirements for the construction under SBCA

SBCA authorities deliberated on this matter and presented the Chapter -20 of KBTP Regulations regarding general standards: bulk and spatial. In the same chapter, they shown the residential density requirements for the residential constructions which can be seen at KBTP Regulations, P 20-3.2.

Procedure of formulation of SBCA building code

SBCA stated that other development authorities i.e. LDA/CDA, Cantonment Board etc. has adopted their regulations with few amendments in order to regulate the constructions in their jurisdiction area. Being an autonomous body, SBCA can make amendments in its bylaws, if JICA is intending to propose some amendment/codes, its no problem for them to adopt in Karachi Building and Town Planning Regulation after proper discussion with stake holders of Karachi.

Provisions regarding height restriction of the building

They invited the attention of the JST on ‘Height Restriction of the Building’ and stated that the restricted flying gap and safety zone as prescribed by the Civil Aviation Authority and PAF are taken into consideration while allowing the height of the building which is mandatory under clause 25-1.10.2.

The necessary information

JST requested to share following necessary information which has been mentioned in the Agenda of the meeting. SBCA accordingly provided as under:-

- 1) Organization chart including number of staff, obtained.
- 2) SBCA building codes/regulations, obtained as KB&TP Regulations.
- 3) SBCA building application for and list of drawings/specification, obtained as KB&TP Regulations.
- 4) Any check list used by building inspector, obtained as KB&TP Regulations. (with using application forms)
- 5) Legal evidence of procedure of formulation of SBCA building regulations, obtained as KB&TP Regulations.

Discussion for JST rough idea

JST shared the document named “Brief presentation of rough idea on this survey at present” to SBCA, they

deliberated on it and replied that if such energy building codes are developed for future construction of commercial, residential and industrial buildings, it will really be useful for energy conservation in Pakistan. As Pakistan is going through serious energy crises. SBCA further assured that whenever JST needs the help, they will be available all the time to help such a national cause.

MEETING MEMO

Date	12 th June, 2015	Time	15:00 p.m. to 16:00 p.m.
Organization	Japan External Trade Organization, Karachi Venue: 2nd Floor, Block B, Finance & Trade Center, Shahrah - E - Faisal, Karachi.		
Department			
Attendances	JETRO: Mr. Kitami - Director JST: Mr. Kuroki, Mr. Kohno		
Obtained Documents	None		
Discussed	<p><u>インセプションレポートの提供と説明.</u></p> <p>JICA 調査団は、本調査のインセプションレポートを JETRO に提供し、さらに、本調査の背景、目的、工程、要員について説明した。</p> <p><u>情報収集</u></p> <p>JICA 調査団は、建物の建設及び建物に付帯する設備に関連して、パ国内の本邦企業の活動及びヒアリングに行くことが推奨される本邦企業の情報について尋ねた。</p> <p>1) 建物の建設</p> <p>建物の建設では、飛鳥建設と大成建設のみがパ国内で活動している。特に飛鳥建設がパ国内での活動歴が長く、知見を有していると思われる。カラチのヤマハ工場も飛鳥建設が手掛けた。</p> <p>2) 建物に付帯する設備</p> <p>エアコンは、三菱電機、ダイキンなどが入ってきている。Acson(ダイキンが技術供与したマレーシアエアコンのメーカー)も見かける。</p> <p>照明は、ほとんど日本製はない。</p> <p>昇降機は、日本製品の引き合いがある。カラチのクリフトン地区のドルメンモールでは、三菱電機のエスカレータが導入されている。富士電機の昇降機にも、引きあい話がきたが、富士電機の方から、メンテナンス員が派遣できないため断ったとのこと。(ポリシーとして、売り切りはできないとのこと)</p> <p>3) その他</p> <p>国土交通省の方が今年3月に来パし、日本企業が主体となったカラチ駅の再開発の可能性検討のための情報収集をしたとのこと。ただし、検討の具体性、真剣度、工程については不明。差支えなければ、帰国後にその時の担当官を訪問したい旨を伝え、先方への打診を依頼した。</p> <p>Panasonic が、家電小物などからパ国へ入ってくることを検討されているとのこと。ただし、検討の具体性、真剣度、工程については不明。差支えなければ、帰国後にその時の担当官を訪問したい旨を伝え、先方への打診を依頼した。</p> <p>熱交換器のサンデンがラホールにある。</p> <p>建物設備とは直接関係がないが、Battery 関連では、本邦企業が強いとのこと。GS ユアサが好調の他、パ国へ新規に展開を検討中のメーカー(社名についても確認したが、守秘義務ということで教えてもらえなかった)もある。</p>		

MEETING MEMO

Date	12 th June, 2015	Time	11:00 a.m. to 12:00 noon
Organization	Pakistan Metrological Department Venue: Pakistan Meteorological Department, University Road, Karachi .		
Department			
Attendances	MET: i. Sardar Sarfaraz - Director ii. Mr. Nadeem Faisal - Deputy Director. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		
Discussed			

Sharing and presentation of inception report.

JST presented the inception report of this survey and also explained back ground, objective, schedule, and members of the survey team on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting.

Necessary information regarding climate zone in Pakistan

Pakistan Metrological Department (PMD) stated that they have the weather observation centers in major cities of Pakistan and they observe the weather observation twice in a day. They have the digital data observed every 12 hours starting from 000 UTC timing. PMD do not have radiation data, further PMD informed that radiation can be calculated by the alternate total sun shine hours.

Data of climate condition in Pakistan

PMD said they have data of climate condition in Pakistan for the following cities:

Item	Span	Duration
Dry-bulb temperature	12 hours	More than 10 years
Wet-bulb temperature	12 hours	More than 10 years
Humidity	12 hours	More than 10 years
The maximum wind speed	NOT existing	NOT existing
Mean wind speed		More than 10 years
Wind direction		More than 10 years
Global radiation of sun and sky on a horizontal surface	Daily	Karachi=> 1967-1991 Lahore=>1967-1991 Islamabad=>1991-1997
Solar irradiance on inclined surface	NOT existing	NOT existing
Annual precipitation, annual rainfall		More than 10 years
Mean annual rainfall		More than 10 years
Monthly rainfall		More than 10 years

Peak rainfall		More than 10 years
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PMD further stated that they have data of following majors cities:

- i. Karachi, 50 years data available
- ii. Islamabad, 32 years data available
- iii. Lahore, 50 years data available
- iv. Rawalpindi, 50 years data available.

Such data is not available at their website but it can only be accessed on deposit of payment prescribed by PMD. Procedure and guidelines have been mentioned at their official website. However, Deputy Director assured that if JST wants to get data, it should write email to Dy. Director, then he will calculate the charges of the requested data.

MEETING MEMO

Date	12 th June, 2015	Time	08:45 a.m. to 09:30 a.m.
Organization	State Bank of Pakistan, Karachi Venue: SBP building, I.I Chundri Road, Karachi.		
Department			
Attendances	SBP: i. Mr. Saeed Ahmad - Deputy Governor of State Bank of Pakistan ii. Syed Samar Hasnain - Executive Director, Development Finance Group. iii. Directors. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		
Discussed	<p><u>Sharing and presentation of inception report.</u></p> <p>JST presented the inception report of this survey and also explained back ground, objective, schedule, and members of the survey team on energy efficiency and conservation on the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting.</p> <p><u>Situation for green banking</u></p> <p>JST asked situation of green banking scheme that Gesellschaft für Internationale Zusammenarbeit (GIZ) acts to promote.</p> <p>1) Recognition degree</p> <p>Deputy Governor stated that State Bank of Pakistan started working with GIZ a few months ago and now it is creating awareness in the operation of the banks in Pakistan. SBP itself is learning what is the best international practices to be done. Now International Finance Corporation has started. wherein a number of Asian Countries are participating, When more number of countries will participate come in this common cause, it will be more useful.</p> <p>It was further stated that commercial banks in Pakistan has started green banking, but they are not so much familiar with green banking. Therefore, the awareness of green bank has to be created.</p> <p>2) Barrier and countermeasure</p> <p>Deputy Governor stated that awareness is the major tool to make the people familiar with the green banking, therefore, a few days back they had seminar/conference where World Bank, IFC, banks, government utility companies, and GIZ participated very actively to understand this issue. K-Electric (An electricity supply company in Karachi) suggested to start pilot projects in order to let the people know about this issue.</p> <p><u>Guidelines by SBP for Solar Energy Panel</u></p> <p>SBP informed that recently SBP has issued guidelines to the all the banks operation in this country to of finance for green energy on concessional rates. They further stated that in KPK Province, street lights have been switched to solar energy panel. The Prime Minister of Pakistan has also launched solar energy project</p>		

in District Bahawalpur which will produce 100 megawatt electricity.

Feasibility to formulate incentive measure

SBP stated presently that there are no incentives, but the Government of Pakistan (GOP) wants to encourage the constructions of houses. Presently over 600,000 backlogs of 9 million housing increment is required to be cut back to be 30,000 housing, and it is carried out. GOP has asked SBP to prepare some incentive schemes which is doing now. Now the SBP is asking the banks to give loan to the people for 10 years in order to purchase solar energy. SBP also trying to find the way in which affordable housing could be provided to the people of Pakistan because people are suffering from reduction of income.

1) Reduction of financing cost

SBP stated that it could reduce the financing cost for any good feasible propositions because it is for the national cause.

2) Tax exemption

SBP stated that taxation is the matter of Federal Board of Revenue (FBR), therefore, they can give good suggestions/propositions on this point.

3) Subsidies

Because the subsidy is directly related with Ministry of Finance (MOF), it is better to approach from the Finance subsidy schemes. In the recent Budget 2015-16, MOF has given some incentive to construction industry but not to energy conservation.

Discussion for JST rough idea

JST shared the document named “Brief presentation of rough idea on this survey at present” to SBP, and requested them to share their opinion regarding this document.

At first SBP appreciated the very good initiative of JICA and it this is one, it will save more energy in Pakistan. SBP stated that the awareness campaigns are needed to start through media in order to make the people familiar.

SBP stated that the government should start pilot project while providing incentives to the maximum people so that this facility could be available for all the concerned. Concerning with the buildings in Pakistan, SBP do not have such data as thousands of buildings in even Karachi.

MEETING MEMO

Date	12 th June, 2015	Time	9:30 to 10:30
Organization	PECT Venue: U-forn tower, Islamabad		
Department			
Attendances	PECT: Mr. Tanveer A. Siddiqui JST: Mr. Hirooka		
Obtained Documents	1. 現地普及の照明器具、空調機カタログ資料		

Discussed

Introduction

Mr. Tanveer A. Siddiqui は日本滞在経験もあり、日本語堪能。設備関連の施工の他、メンテナンス業者として日本大使館と契約している。

空調設備一般状況

1. ショッピングモール、病院、ホテルではセントラル空調が主流。事務所建築物ではセントラル、スプリットが混在している。
2. ビル用マルチを出しているのは HIER (中国製でパキスタンで組み立て)、ACSON(マレーシア製でダイキン傘下)、MITSUBISHI, TOSHIBA がある。マルチ型のインバータタイプも手に入る。
3. 高層の複合ビルでは下層階の商業施設はセントラル方式、高層部のマンションはスプリット。
4. 飲食施設はスプリットが主流

空調設備マーケットシェア

1. 住宅用空調機では多くの機種が入っており、シェアは良くわからないが、エンドユーザーは性能よりもコストに重点を置いていることは確か。
2. 大規模建築案件では、ACSON, MCQUAY, MITSUBISHI が主流
3. 政府系既存建物への空調器納入案件が PPRA で実施されることがあるが、品質基準が緩く、価格競争で決定している。中国製の GREE が低価格の為、強い。

給湯一般状況

1. 一般住宅においてはガス式の給湯タンクが多い。またキッチンではガスレンジが主流。
2. 病院、住宅ではソーラーパネルを利用した温水タンクが普及している。
3. ホテルはガスボイラーによる給湯が一般的。
4. 最近のマンションではガス式瞬間湯沸かし器が普及してきている。各バスルームごとに瞬間湯沸かし器を設置する事例も増えている。数が増えるが配管が少ないこと、故障の場合のメンテがしやすいメリットが評価されている。

照明器具

1. フィリップスが普及しており、病院、大規模事務所、政府系案件の蛍光灯を多く納入している。
2. PIERLITE 社はパキスタンに組み立て工場があり、普及している。
3. LED ライトも入ってきているが、それほど普及は進んでいない。低価格の輸入 LED も入ってきているがまだ、品質が実証されていない。

メンテナンス

1. マンション建築においては竣工後の 1 年くらいは各住戸から 2000-5000PKR を徴収してメンテナンスをするのが一般的だが、その後の継続的な監理体制に関してはマンションごとに異なる。管理組織が無いことも多い。
2. 政府系の建物は実情メンテナンスされているかどうか疑問である。
3. エレベーターに関してはエレベータ業者が定期点検を行うシステムがあるが、有料であることからオーナーが契約しなければメンテナンスがされない。
4. 病院、ホテルは常駐のメンテナンスチームが存在するが、予算が限られているのが問題。
5. プライベートセクターは相対的にメンテナンス体制がしっかりしている。またインダストリアルセクターもメンテナンス体制が確立している。
6. ビル管理をしっかりしている案件ではメンテナンス会社が契約されており、建物のパブリックスペースの担当をしている。空調、照明、発電機、エレベータを定期的に点検する。テナント内のスペースに関しては基本的にテナントの責任範疇であるが、メンテ会社に要請があれば対応している。

MEETING MEMO

Date	15 th June, 2015	Time	11:00 a.m. to 12:00 noon
Organization	Ministry of Science and Technology Venue: Ministry of Science and Technology, F-5/1, Islamabad		
Department	Ministry of Science and Technology		
Attendances	<p>MOST: Mr. Muhammad Khalid Siddig - Joint Secretary Mr. Ashfaq Ahmed - Deputy Technological Adviser Mr. Ashtiaq Ahmad - Assistant Technological Adviser</p> <p>PEC: Mr. Ghulam Karim - Deputy Register/ HOD Mr. Faiz ul Sibtain - Project Liaison Coordinator for Building Code of Pakistan (Energy Provisions-2011)/ Junior Executive</p> <p>PSQCA: Mr. Muhammad Ashraf Palari - Deputy Director (Electrical)</p> <p>PCSIR: Dr. Syed Narmat Ali Rievi - Member technology, Board member</p> <p>PNAC: Mr. Ateeq-ur-Rehman Memon – Deputy Director General</p> <p>NIE: Mr. Faisal Paracha - Senior Research Officer</p> <p>PCRET: Mr. Nadeem Zakir - Director Project (Photovoltaic)</p> <p>JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki</p>		
Obtained Documents	None		
Discussed	<p><u>Presentation of CASBEE and BELS</u></p> <p>JST presented the implementation of CASBEE and BELS in JAPAN as assessment and labeling system. JST showed that CASBEE and BELS are very valuable for the energy efficiency & conservation in the building sector, through introducing the current situation of the management of CASBEE and BELS by the local government, and incentive countermeasure to arouse the people to know CASBEE and BELS.</p> <p>MOST noted that in comparison with history of Japanese EE&C effort, Pakistan has just launched process. It will require several countermeasure step by step.</p> <p><u>Number of Buildings that granted BELS</u></p> <p>MOST asked how many buildings granted BELS in Japan and how high grade.</p> <p>JST replied that we would give such information later and emphasized that housing developers utilized such labeling scheme in order to advertize their advantage.</p> <p><u>The other relevant organization that JST should meet</u></p> <p>PEC suggested meeting with Pakistan Environmental Planning & Architectural Consultants (PEPAC) and Pakistan Council for Architecture and Town Planning (PCATP).</p> <p>JST requested that PEC would share contact number and e-mail address of focal person regarding such organization.</p> <p><u>Awareness activities for BCP-EP-2011 by PEC</u></p>		

PEC informed that they act to introduce Pakistan Building Code Energy Provision (BCP-EP-2011) in some universities.

JST requested that PEC would share such information, objective of activities, in how many universities, against how many students.

Current BCP-EP-2011 Standards

Answering MOST question, PEC indicated that current standards are referring ASHRAE standards. JST mentioned that current standards, i.e. wall/ roof U-value, does not have variety based on the climate zoning and usage of building. JST presented Indian standards for their information.

MEETING MEMO

Date	2 nd June, 2015	Time	11:30 a.m to 1:00 p.m
Organization	ENERCON G-5/2, Islamabad		
Department			
Attendances	ENERCON: Mr. Asad Mahmood - Technical Manager, ECF/ENERCON JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents	CD Latest Bill		
Discussed			
<p><u>Awareness activities by ENERCON</u></p> <p>ENERCON informed that they acted for capacity development in 25 universities and apart from it they have carried Sessions on Manuals for Improving Energy Efficiency in Electrical Systems which includes building section as well, Improving Steam Boiler Operating Efficiency and Tube well Energy Audits all the manuals with presentations are uploaded on ENERCON website and have many circulated to many stakeholders.</p> <p><u>Share of latest version of EE & C Bill</u></p> <p>JST requested to share latest version of EE & C Bill.</p> <p>Mr. Asad committed to share latest version of EE & C Bill as softcopy. (JST had already received it by e-mail.)</p> <p><u>Role of ENERCON in the building sector</u></p> <p>JST asked role of ENERCON in the building sector.</p> <p>Mr. Asad informed that latest version of EE & C Bill defined such article on v of 2, “buildings sector” means all buildings including private domestic household, commercial, industrial, public and community buildings.</p> <p>Further he stated under article (p) and (q) of 10, “Federal government, in consultation with the Authority, may prescribe energy conservation building codes for efficient use of energy and its conservation in the building or building complex, may amend the energy conservation building codes to suit the regional and local climatic conditions.”</p> <p>Mr. Asad informed that mentioned Authority would establish after enactment of EE & C Bill as renewal ENERCON. So renewal ENERCON would have reasonable power in order to prescribe and amend PBC-EP-2011.</p> <p><u>Educational activities of ENERCON</u></p> <p>Mr. Asad informed that ENERCON carried out educational activities and updated seminar notification on ENERCON facebook.</p> <p>JST requested to share text document or guidebook on such seminar. Mr. Asad said that there are various</p>			

documents which are consulted however the manuals are also used which are already uploaded on ENERCON website

Handbook for BCP-EP-2011

ENERCON stated that they have notified in the new paper for consultancy service for revision to Handbook to reflect all revisions made in BCP-EP-2011 and follow up seminar. (Budget approx 2-3 mil PKR) However, there was no candidate who expressed interest. ENERCON thinks that one of the conditions, registered under PEC, might have limited opportunities for non-registered experts. ENERCON is expecting JST input for next action. ENERCON to provide TOR of last notification for JST review.

MEETING MEMO

Date	16 th June, 2015	Time	13:00 a.m. to 14:00 p.m
Organization	Pakistan Engineering Council Venue: Pakistan Engineering Council, G-5/2, Islamabad		
Department			
Attendances	PEC: Sc. Faiz ul Sibtain – Project Liaison Coordinator for Building Code of Pakistan (Energy Provisions-2011) JST: Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p><u>Education in the building sector in Pakistan</u></p> <p>JST requested that PEC would share education level of university in Pakistan, e.g. how many universities have course regarding building sector, how many students and what type expertise of student and how many students study there, item of curriculum also.</p> <p>PEC replied that respective data (engineering disciplines and total number of qualified registered engineers in Pakistan). In this regard, JST may send official request to Registrar PEC for onward approval to share such kind of data with JICA.</p> <p><u>Education by ENERCON</u></p> <p>JST asked demarcation between PEC and ENERCON regarding education. Since ENERCON seems to be acting as educational institution.</p> <p>PEC replied that ENERCON do not carry out engineering education related activities, because it is govt. department established for energy policy and conservation related matters only. According to PEC, activities of ENERCON focused to provide guide line, energy conservation policy and energy conservation program, to establish laboratory, to design energy conservation standard, to conduct survey of issues.</p> <p><u>Registration system in Pakistan (Practice of consulting engineers)</u></p> <p>JST asked the difference between PEC registration and public development authority registration.</p> <p>Mr. Faiz explained that PEC has established a dedicated ‘Registration Department’, who received applications for Constructors and Consultants, and after due official process, granting licence on merit and due qualifications. In this regard, a separate meeting might be scheduled with the Head of respective department with the prior permission of Registrar PEC for further details.</p> <p>Whereas list of approved and notified documents is available at PEC website www.pec.org.pk for ready reference. Application form for constructors and consultants are also available on PEC website.</p> <p>Above registration system operated as mandatory basis, and participants should re-new license periodically every year.</p> <p><u>Registration by PEC (Individual engineers)</u></p> <p>JST asked mechanism of PEC registration system.</p> <p>PEC explained that after qualifying the PEC accredited engineering programs, PEC registered engineering graduates as a ‘Registered Engineer’. Now after notification of CPD Byelaws-2008, continuing professional development activities (short course, seminars, workshops, writing an articles etc.) become mandatory for all registered and professional engineers on annual basis. Every CPD activity has been allocated CPD points as mentioned in CPD Byelaws-2008.</p> <p>JST asked if PEC registration system provides any penalty.</p> <p>PEC explained there for smooth implementation every law defines certain penalties and restrictions.</p>		

Calculation software program for energy conservation design

Mr Faiz ul Sibthian informed that Department of Energy (DOE), United States has developed a software namely COM-check in order to support energy conservation design during development of building envelop. Such kind of software applications are very much needed for Pakistani engineers as well and in next phase of Building Energy Code revision, such kind of software applications might be reviewed, if applicable under indigenous conditions.

Other provision of building code

PEC informed that they provided Pakistan Building Code Seismic Provision 2007, but so far it was not revised. So PEC has the plan to amend that provision in near future with the support of potential donors like JICA.

PEC seeking financial support from JICA for revision and updation:

Building Code of Pakistan Seismic Provisions (2007)

Building Code of Pakistan Energy Provisions (2011)

Pakistan Electric and Telecommunication Safety Code (PETSAC-2014) soon will be notified.

PETSAC-2014 is developed with financial support of USAID-PDP, Pakistan within two years by PEC.

Building Code of Pakistan Fire Safety Provisions (road map devised for development)

MEETING MEMO

Date	17 th June, 2015	Time	9:40 to 11:00
Organization	ENERCON Venue: ENERCON, G-5/2, Islamabad		
Department			
Attendances	ENERCON: Mr. Hassan Nasir Jamy - Managing Director. (additional secretary of MOWP) Mr. Noman Rafiq - Company Secretary, ECF Mr. Asad Mehmood - Technical Manager, ECF/ENERCON JICA: Mr. Ogasawara JST: Dr. Hagihara, Mr. Kurosaki, Mr. Hirooka, Mr. Kohno, Mr. Kuroki		
Obtained Documents			
Discussed	<p>JICA 小笠原氏より本ラップアップ会議の概要説明が冒頭にあり、以下の二つの調査についての報告がそれぞれのチームからなされた。</p> <p>Part 1: 省エネ普及促進</p> <ol style="list-style-type: none"> 1. 省エネ法最終承認については、現在 Standing Committee がタマをもっており、これに2、3ヶ月はかかるだろう。しかし、MOWP 大臣がその委員であり、心配はいらない。3月24日には、首相が議長となっている Council of Common Interest にレターも送っている。Standing Committee 承認後に Parliament での承認が必要となるが、これには時間がかからないはずである。(MD) 2. 新 ENERCON の枠組みを外部コンサルに検討させるが、報告書ができるまで3ヶ月程度かかるだろう。報告書はもちろん、TOR も提供する。(MD) 3. PSQCA の関係については、PSQCA 側の誤解と両者間のコミュニケーション不足がある。BRESL/PSC などの重要な会議には PSQCA から委員が出ていたが、出席者の交代などもあった。また、MOST の Secretary が代わったばかりであるという事情もある。前 Secretary には事情をよく理解していたが、彼がいなくなったので、MOST 内部で時間がかかることになるかもしれない。事態改善を目指し、PSQCA に過去の議事録を送付し、また、MOST にもレターを出す。(MD) 4. ENERCON が8人のテクニカル・スタッフを新たに雇う件については、Federal Public Service Commission に申請を出した。通常、諸々の手続きを経て、1年後に着任ということになるが、期間を6ヶ月程度に短縮したいと考えている。なお、PH.D.保持者は、なかなか政府に職を得ようとしなない。(MD) 5. 省エネ法最終承認後の10億 PKR の予算は、ECF ではなく、ENERCON に対してである。(MD) 6. 太陽光発電に関するインセンティブ策は、首相のリーダーシップによるものである。制度設計は Ministry of Food Security が行なった。(MD) 次回ミッションでのアポ取りを依頼し、快諾を得た。 7. ロードマップ (MEPS 非適合製品の排除) に関する方針について Noman から質問があった。今回は現状調査を行なっただけ、次回ミッションで、取り組み方を協議・検討していきたいと回答した。 		

8. ENERCON の今後の取り組みにおいては商工会議所の協力が有効なので、両者のコミュニケーションが重要であるとの指摘に対し、MD の同意があった。

Part 2: 建築分野

1. JST より、第 1 回現地調査の概要を報告した。BCP-EP-2011 の運用がまだ各建築行政レベル（カラチを除く）で実施されていないという状況の認識の一方で、自発的に省エネを考慮する動き、必要な資材、機器は市場に出回り始めている認識を持ったことを説明。
2. JST より今後の優先すべき検討事項案を説明。①マスタープラン、②人材育成（ハンドブック含む）③BCP-EP-2011 の改訂、④ラベリングシステム導入、⑤インセンティブ。参考まで日本において建築物の省エネルギー政策の歩みと CASBEE, BELS に関してスライドで説明。
3. MD より建物に対するラベリングシステムは非常に興味深いとコメントあった。最近パリに出張した際に EU のラベリングに関しても見識を深めたとのこと。
4. MD より、省エネに対する意識向上のためのパンフレット、ハンドブック作成のための予算は確保しており、作成のためのコンサルタント募集をしたが希望者が無かったことが説明された。担当の TM の見解では PEC の技術者登録を義務付けしたことがハードルになったのではないかと考えている。再募集に先駆けて、JST と意見交換しながら進めたい。
5. JST 提案の中で PEC の枠組みの CPD において技術者の育成をするという案に対して、TM より、CPD は有料であり、上述 PEC の登録技術者に対する受講料割引があると説明。ENERCON としては無料で受講できる方法を検討しているとのコメントがあった。
6. ENERCON では省エネを実現したプロジェクトのコンテストを実施予定。ショートリストを作成中。
7. JST より調査のためのローカルコンサルタントと契約したことを報告。既存建物、新築案件等の調査協力のためのサポートレターの発行を依頼し、MD より快諾を得た。また、ローカルコンサルタントが ENERCON の TM から情報収集すること、必要な打合せ等を行うこと等についても了承を得た。

MEETING MEMO

Date	5 th August, 2015	Time	11:00 a.m to 12:00 noon
Organization	Ministry of Housing and Works Venue: Room 213, 2 nd Floor, B-Block, Pak Secretariat, Islamabad.		
Department			
Attendances	MoHW: Mr. Muhammad Irfan, Director General (Housing)/Focal Person for P.M Housing Scheme. ENERCON: Mr. Asad Mehmood, Technical Manager. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		
Discussed	<p><u>Sharing and presentation of Draft progress report.</u></p> <p>At the outset, JST presented the Draft progress Report prepared under direction of JICA for energy efficiency and conservation in building sector of Pakistan. JST further explained background and objectives of the survey team. It was also explained that Draft Progress Report included legal system and stakeholders on energy efficiency and conservation in the building sector of Pakistan, situation for building construction and implementation framework of building code (energy provision) in major areas of Pakistan (Islamabad, Lahore and Karachi).</p> <p><u>Summary of MOHW</u></p> <p>JST informed that they understood that according to Rules of Business, 1973, the Ministry of Housing and Works does not have power and function to make legal framework regarding construction and authorize construction regulation. JST, therefore, requested to know that who has such role and function for authorization on building construction.</p> <p>Mr. Muhammad Irfan, Director General, at the very inception, informed that when the Building Codes (Energy Provisions) were formulated in Pakistan, JICA was not part of it. He further explained that they did have their own Task Force to formulate building codes in Pakistan. Therefore, he suggested that JST should have approached the concerned Task Force in order to get their opinion on this Draft Progress Report. He said until and unless JST interacted with the Task Force, it would not be able to implement these building codes.</p> <p>He reiterated that Government of Pakistan had notified a document (Building Code of Pakistan, Energy Provision-2011) which contained two things i. energy provision and ii. Building Codes. The buildings in</p>		

Pakistan are constructed in accordance with the regulations laid down by the concerned development authorities i.e LDA, CDA, RDA and SBCA. To implement the energy provisions, meeting with Task Force is very much essential, Mr. Irfan vehemently suggested.

MOHW informed that most of people in Pakistan are poor and they cannot follow the building codes due to very less income and non-availability of sufficient sources, therefore, energy provisions in building code of Pakistan are not MANDATORY. Mr. Asad Mehmood, Focal Person of ENERCON also ratified the statement of Mr. Irfan regarding not mandatory provision in Building Code of Pakistan (Energy Provision).

Mr. Irfan suggested that Draft Progress Report should be ratified by Task Force members initially because Task Force members are very much familiar with these codes and ground reality of Pakistan. For that purpose, he requested Mr. Asad kindly to write an official letter to Pakistan Engineering Council (PEC) for arrangement of meeting of Task Force. Thereafter, Task Force will formally give its input on this report which will ultimately strengthen this report. Mr. Asad accordingly assured to arrange such meeting of Task Force.

Mr. Irfan also suggested the JST to initiate campaigns in order to educate the people through seminars, workshops and newspapers nationwide and in order to implement the building code of Pakistan (energy provision-2011), because if the more people are familiar with it, and the more people will comply the building code.

MEETING MEMO

Date	5 th August, 2015	Time	02:30 p.m to 04:00 p.m
Organization	Pakistan Engineering Council Venue: PEC G-5, Islamabad.		
Department			
Attendances	PEC: Mr. Ghulam Karim, Deputy Registrar and Mr. Faiz ul Sibtain, Project Coordinator/Junior Executive. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		

Discussed

Sharing and presentation of Draft progress report.

JST presented the Draft progress Report prepared under direction of JICA for energy efficiency and conservation in building sector of Pakistan as hardcopy to Pakistan Engineering Council and also explained background and objectives of the survey team.

1) Classification of building

JST showed building categories of Japan and stated that Japan has categorized buildings into following eight categories:-

- i. Dwellings, ii. Accommodation (Hotels), iii. Offices
- iv. Educational facilities (schools), v. Medical facilities (Hospitals)
- vi. Factories, vii. Commercial buildings and, viii. Cultural buildings.

Based on above stated category, JST requested PEC to share the building categories of Pakistan. Mr. Ghulam Karim stated that building categories in Pakistan is more or less the same like Japan but Ministry of Housing and Works may have an appropriate classification.

2) Summary and history of building code of Pakistan (energy provision)

JST requested to know the summary history of building code regarding energy in Pakistan, particularly Building Energy Code of Pakistan 1990 (hereinafter referred to as "BECP-1990"). PEC informed that BECP-1990 was prepared by ENERCON in the year 1990 when ENERCON was under the control of Ministry of Housing and Works. Now this document is no more applicable because PEC New Code, Building Code of Pakistan Energy Provision-2011 (hereinafter referred to as "BCP-EP-2011"), has superseded the previous one. Pertinently, BECP-1990 was not mandatory but the new building code (energy provision) is mandatory for some buildings which fall within the specification laid down in it. PEC stated that PEC consulted the BECP-1990 in establishment of new BCP-EP-2011.

3) Role and activities of PEC

JST requested PEC to clarify the role and functions of it written at the Draft Progress report. PEC assured to provide necessary input after reading it carefully that will be supplied to JST by email as soon as possible.

(The report had been already shared on 6th August.)

4) Capacity of engineers

JST requested the PEC to clarify the description regarding capacity of engineers written at the Draft Progress Report. PEC assured to provide necessary input, if any, after reading it carefully that will be supplied to JST by email as soon as possible. (The report had been already shared as mentioned.)

5) Criteria and penalty of BCP-EP-2011

PEC stated that still there is no criminal punishment system defined to punish those who violate with the Building Code (Energy provision). PEC, however, informed that National Disaster Management Authority (NDMA) through Directive of Prime Minister of Pakistan has directed and proposed that whoever violates the building code energy provision, she should be punished by penalty and such violations should be considered as criminal offence.

6) Procedure of preparation of BCP-EP-2011

JST asked to clarify the description regarding procedure of preparation of Building Code of Pakistan (Energy Provision-2011) written at the Draft Progress Report and also procedure of review of BCP-EP-2011. PEC made commitment to provide necessary input by email. (The report had been already shared as mentioned.)

7) Stake holder and Responsibility demarcation

JST requested that PEC would check the description regarding stake holder and Responsibility demarcation written in Draft Progress report. PEC promised they would inform the opinion regarding stake holder and Responsibility demarcation on the report, if the soft copy of the report was shared. (The report had been already shared as mentioned.)

Curriculum regarding EE&C in the building

JST requested to know what kind of curriculum is being provided in the universities and colleges. PEC informed that this matter can be discussed in detail with Dr. Nasir, PEC who is specifically assigned this job. It was tried to contact with him but due to his non-availability, this point could not be clarified. However, PEC informed that they have established new curriculums for EE&C in the building Sector i.e. B.Sc (Energy System Engineering Program)

Policy and schedule of 2nd survey

JST shared the schedule of JST for 2nd survey on energy efficiency and conservation in building sector of Pakistan and requested PEC to introduce JST among relevant organizations so that JST can easily gather data on the topic, but PEC suggested JST to request JICA to issue an official letter to all the relevant Ministries and that will be circulated among all the relevant organizations, thereafter all agencies will be bound to provide information to JST. Otherwise, nobody will give any information to JST.

Necessary Information on high education grade

JST requested PEC to shared information of curriculum regarding EE&C in the building on high education grade i.e university and college as discussed above. PEC referred this matter to Dr. Nasir who was not available in PEC, therefore, this information can be got when we will have meeting with PEC again.

Barriers face by PEC

Keeping in view of the above discussion, PEC informed that at first, they need to develop handbook/guidelines for adoption of building code (energy provision-2011) and they do not have financial support for it. Therefore, they are looking forward to financial support from any international donor in order to upgrade the existing system and to implement the building code (energy provision).

Discussion of Software developed by USA.

PEC informed that recently United States of America has developed software designing the building within no time. This software is very much useful for the future generation. Its name is COMcheck that can be seen at www.energycodes.gov/comcheck

MEETING MEMO

Date	6 th August, 2015	Time	02:00 p.m to 02:45 p.m
Organization	Capital Development Authority (CDA) Venue: CDA Head Office, G-7 Islamabad.		
Department			
Attendances	CDA: Mr. Waseem Ahmed Khan, Member (Planning) JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	<ol style="list-style-type: none"> 1. Islamabad Residential Sectors Zoning (Building Control) Regulations-2005 (as obtained Legal evidence of procedure of formulation of CDA building code, Detailed document for building approval process) 2. CDA building application form, 3. CDA check list used by building inspector, 4. List of staff numbers of directorate of building control, CDA 5. Approval check report form and, 6. Number of application received by CDA, from July 2014 to July 2015. 		
Discussed			
<u>Sharing and presentation of Draft progress report.</u>			
<p>JICA Survey Team (hereinafter referred as JST) presented the Draft progress Report prepared under direction of JICA for energy efficiency and conservation in building sector of Pakistan as hardcopy to Member (Planning) and also explained progress situation, i.e. survey result regarding legal system and stake holders regarding EE & C in the building sector, situation for building construction, implementation frame work of Building Code (Energy Provision) in capital area as well.</p> <p>1) Classification of building</p> <p>JST discussed the case of Japan and stated as follows;</p> <p>Japan has categorized buildings into eight typical categories as follows:</p> <ol style="list-style-type: none"> i. Dwellings, ii. Accommodation (Hotels), iii. Offices iv. Educational facilities (schools), v. Medical facilities (Hospitals) vi. Factories, vii. Commercial buildings and viii. Cultural buildings. <p>Keeping in view of the above categories of Japan, CDA accordingly informed that following categories of buildings are existing in Islamabad:-</p> <ol style="list-style-type: none"> i. Residential buildings ii. Commercial buildings iii. Industrial zone iv. Public building sites. <ol style="list-style-type: none"> a) Hospitals b) Educational Institutions 			

c) Government department/offices

2) Number and energy consumption of buildings

JST requested how to know number and the energy consumption of buildings. CDA informed that presently no data regarding number and energy consumption of buildings is available with CDA. However, information regarding energy consumption of buildings can be requested to Islamabad Electricity Supply Company (IESCO) as relevant Agency. IESCO has data of energy consumption in respect of all buildings pertaining in their jurisdiction.

3) Socioeconomic Situation index regarding building construction

CDA informed as follows;

No data showing socioeconomic situation in building of Pakistan is available because no such survey had been conducted in Islamabad. Its dominating activity is construction of residential houses in Islamabad. CDA receives 1,806 applications of building plan and for issuance of completion certificates annually. Ratio is calculated as below:

- Applications for Commercial buildings : 5%
- Applications for completion certificates: 10%
- Building plans (? Is this residential houses): 90%

Stakeholder and responsibility demarcation:

CDA discussed below.

CDA did not participate the preparation of BCP-EP-2011. CDA seem CDA has not been part of BCP-EP-2011, therefore, cannot give any opinion on it.

Implementation system regarding building code

1) Human resource of inspection department for Building Code

On request of JST, CDA provided following information in respect of human resource of inspection department for building code:-

- i. How many inspectors are in inspection department: **16 inspectors.**
- ii. License, degree and experience of inspector: **Qualification is Diploma of Associate Engineer (DAE), Civil or 1 year certificate in civil drafting.**
- iii. How many applications CDA receives annually: **1,806**

2) Diagram inspection

CDA informed that following staff looks after the diagram inspection:

- i. 1 Director (Building Control)
- ii. 3 Deputy Directors (Building Control)
- iii. 8 Assistant Directors (Building Control)
- iv. 26 Inspectors (Building Control)
- v. 12 Assistant Directors and 16 inspectors are concerned with the diagram
- vi. CDA received approximately 900 applications for the last half year.

3) Site Inspection

CDA informed as follows;

They have established Directorate of Building Control which inspects the site physically and Building Inspectors of CDA visit the site regularly till completion of the building.

Building Code of Pakistan (Energy Provision) 2011

CDA informed that no building code (energy provision) in existing building sector had been adopted. However, he said that building code (energy provision) was essential in this modern time, therefore, it should be adopted as soon as possible.

On question of JST, CDA informed as follows;

CDA have a good number of staff members in Directorate of Building Control, CDA. The relevant staff (Building Inspectors) visits the sites in accordance with the CDA regulations. Capacity development can be provided to the staff if it is available in order to enhance the capability of staff.

Necessary information:

CDA informed as follows;

18,000 staffs are consisting upon officers/official working in various departments of CDA. In regards with CDA building code, it was informed that CDA does not have separate from Building Code of Pakistan, rather they follow Building Code of Pakistan Seismic Provision 2007 which are mainly concerned with designing and structures of the buildings.

Number of projects have been done including the Stock Exchange Building, Saudi Pak Towner, State Life Insure Corporation Building, and etc. Number of projects are coming up like Park-I in F-10, Islamabad.

At the end, CDA stated as follows;

They do not have stern restrictions for the developers and builders to follow certain codes in order to avoid massive energy consumption. For that purpose, people should be educated through media campaigns so that more energy could be saved.

- Number of staff by wing of CDA, grasped as mentioned through interview,
- CDA building code, obtained,
- CDA building application form and list of drawing/ specification, obtained,
- Any check list used by building inspector, obtained,
- Legal evidence of procedure of formulation of CDA building code, obtained,
- Number of human resource for building approval process, grasped as mentioned through interview,
- Detailed process and document for building approval process, obtained,
- Detailed information for review process for BCP-SP-2007, grasped as mentioned through interview,
- Number of projects, scale of project in recent years, grasped as mentioned through interview,

(Memo is over)

MEETING MEMO

Date	5 th August, 2015	Time	08:15 a.m to 09:30 a.m
Organization	ENERCON Venue: ENERCON Building G-5, Islamabad.		
Department			
Attendances	ENERCON: Mr. Asad Mehmood, Technical Manager. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		
Discussed			

Sharing and presentation of Draft progress report.

JST presented the Draft progress Report prepared under direction of JICA for energy efficiency and conservation in building sector of Pakistan as hardcopy to Mr. Asad Mehmood and also explained background and objectives of the survey team.

Classification of building

JST discussed the case of categorization of Japanese building and stated that Japan has categorized buildings into eight typical categories as follows:

- i. Dwellings, ii. Accommodation (Hotels), iii. Offices
- iv. Educational facilities (schools), v. Medical facilities (Hospitals)
- vi. Factories, vii. Commercial buildings and, viii. Cultural buildings.

And requested to know the categories in Pakistan. Mr. Asad accordingly replied that ENERCON is going to categorize the buildings of Pakistan in the National Energy Efficiency and Conservation Award (NEE&C Award). Generally buildings will be categorized into following categories:

- i. Hospitals.
- ii. Universities and Schools
- iii. Shopping Mall/Plazas
- iv. Hotels

Mr. Asad stated that ENERCON has hired a consultant firm and assigned task of categorizing the buildings in Pakistan. This firm will carry out survey of the buildings in Pakistan and they will gather information through the questionnaire containing specification of the buildings.

Number of Buildings and energy consumption

JST requested to know the energy consumption of buildings. ENERCON informed that as such no data is available that shows the consumption of buildings in Pakistan. However, it can be got if one just sends meter number of the buildings and ENERCON would get history of energy consumption of that particular building. Mr. Asad further suggested that if JST should request Designmen (Sub-Contractor) to take

reference number of all the selected buildings for survey which include 20 buildings in Islamabad, 20 buildings in Lahore and 20 buildings in Karachi, and then ENERCON would get the history of consumption of these buildings by writing letter to relevant DISCOs.

Socioeconomic Situation index regarding building construction

ENERCON informed that common perception was that the people bought flats/apartments in the buildings and it was becoming a trend in these days. Socioeconomic situation is directly related to banking regulations in Pakistan because most of the people are poor and if they are refused for loan by banks, they will prefer borrowing to buying flat or apartment in the buildings.

Situation of building maintenance

ENERCON discussed and informed that some maintenance companies had applied to ENERCON for Energy Audit Services and some companies were working for buildings maintenance in the entire Pakistan. Particularly there is one major firm which is not only operating in Pakistan but also outside of Pakistan (UAE) as well. When ENERCON advertised in the newspaper for enlistment of services provider, few companies applied for enlistment. One of them is I&M that is working for building solutions and maintenance services. This company is majorly carrying out maintenance of some good buildings in Pakistan like Serena Hotel Islamabad and Agha Khan Hospital, Karachi are examples.

Summary and history of buildings code of Pakistan (Energy Provision)

JST showed the draft progress report to the ENERCON and requested to suggest any discrepancy in the report. ENERCON informed that Old Code of 1990 document was prepared by ENERCON when ENERCON was under administrative control of Ministry of Planning. ENERCON has also prepared compliance handbook of building energy code which is not called energy provision.

Role and Activities of ENERCON

ENERCON informed that a full study on building sector of Pakistan had been done and that have already been shared with Mr. Hirooka. Based on this survey of Air Conditioner and Lighting, the potential in the building sector in Pakistan has been approximately calculated from 20% to 30%. Mr. Asad assured to send softcopy of this study.

On request of JST, ENERCON informed that the organogram of the ENERCON written in the Draft Progress Report is not correct and they are going to change the structure of ENERCON based on the Energy Efficiency and Conservation Act, 2015. For that purpose, ENERCON has hired services of a consulting firm to restructure ENERCON's structure. This restructuring proposed by Consulting Firm will accordingly be approved by Board of Governor of ENERCON.

Manufacturers

ENERCON informed that there is no lighting association in Pakistan but HVACR society is existing and actively working in Pakistan. Similarly Pakistan Electric Motor Manufacturers Association (PEMMA) is

exists in Pakistan, which has more than 250 members in Pakistan.

Pakistan Electric Fan Manufacturers Association also exists ~~that~~ and consists upon more than 200 members.

Process of Preparation of BCP-EP-2011.

ENERCON informed that process of preparation of building code (energy provision) has been written in the EE&C Act, 2015. Duration of review has also been mentioned in the BCP-EP-2011-document that after how many years, the codes will be revised .

He, however, stated that a Task Force was developed by the government of Pakistan for formulation of BCP-EP-2011 particularly. In future, there might be new members of Task Force and they will come in. But after approval of the EE&C Act, all responsibility will lie with ENERCON to formulate such Task Force. He suggested making things easy, and the diagram of BCP process written in the Draft Progress Report and be converted into paragraph that will be easy to understand instead of diagram.

Stakeholder and responsibility demarcation

ENERCON informed that building code and building standards are different, if it is standards then it obviously relates to PSQCA but standards cannot be given to buildings. Equipment used in buildings can be checked whether having bench marks or not.

Pilot projects

ENERCON stated that if label is brining at early stage, it will confuse the building code, therefore, JST should lay down foundation that buildings selected for survey are complying with building code. If the existing buildings are complying with code, it can be converted into labeling system.

MEETING MEMO

Date	6 th August, 2015	Time	05:00 p.m to 6:30 p.m
Organization	Pakistan HVACR Society Venue: F-8 Markaz, Islamabad		
Department			
Attendances	Pakistan HVACR Society: i. Mr. Mubashar Ahmad, Vice President. ii. Fahim A. Khan, Director-HVAC & MEP iii. Mr. Saqib Rasool Kanju, Executive Secretary JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Annual Report of 2015.		

Discussed

Introduction and presentation of inception report.

At the inception, JICA Survey Team (hereinafter referred to as “JST”) thanked the Pakistan HVACR Society (HVACR is abbreviation of “Heat, Ventilation, Air Condition and Refrigeration”) for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.

Presentation by Pakistan HVACR Society

Vice President gave presentation on Pakistan HVACR Society and stated as follows;

The idea of Pakistan HVACR Society representative body was conceived for the first time in 1993. At that time, National Institute of Technical Education Islamabad - Ministry of Education, wanted to hold a National Conference / Workshop on Air- conditioning and Refrigeration Technology. In June 1993, they approached leading Manufacturers, Contractors, Engineers and Consultants associated with the HVACR Profession & industry. The idea was to consolidate and promote HVACR activities in the Country. This objective is appealed to all organizations associated with the HVACR field and full support was extended to NITE. It was decided to conduct a technical exhibition pertaining to HVACR products concurrently with a technical conference on issues & problems related to HVACR profession, trade & industry. It was decided to conduct the first Exhibition and Conference on October 23-24, 1993 at National Technical Teachers Training College Islamabad. They explained the history of HVACR briefly.

Pakistan HVACR Society further stated as follows;

They have their three chapter offices in Islamabad, Lahore and Karachi respectively and Expo rotates every year in the chapter offices. They said next Expo will be held from 3-6 March, 2016 at Karachi, JICA/JST may very kindly participate in that.

Relation with ASHRAE

Pakistan HVACR Society stated as follows;

They are affiliated with American Society for Heating, Refrigeration and Air Conditioner Engineers

(hereinafter referred to as “ASHRAE”). This organization does conferences, seminars and exhibitions. Pakistan HVACR Society follows this organization and conducts exhibition in Pakistan.

Pakistan HVACR Society activities:

Pakistan HVACR Society informed that functions and role of their society written in the table of Agenda is entirely correct. They have also gone through the mission, vision, membership and achievement columns.

Number of members

Pakistan HVACR Society stated that they have 1,800 members consisting upon following categories:

- i. Founder Members
- ii. Life Members.
- iii. Members
- iv. Student Members.

These members are of Traders, Contractors, Constructors, Professional Engineers, Consultants, Architects and Designers etc. Information relating to members will be sent by email as well.

Main manufacturers for split type Air Conditioner

Pakistan HVACR Society stated that there are only two Split A.C manufacturers in Pakistan

- i. Sabro Pakistan
- ii. Patel (It is “PEL?”)

These two manufactures are manufacturing A.Cs in Pakistan. Rest of following basically import equipment from other countries and assemble them in their assembling plants.

In case of central air conditioning system with gas chiller type, the manufacturers is,

- i. Kawasaki, ii. Ebara, iii. Hitachi, iv. Mitsubishi, v. Sanyo, vi. Trane,
- vii. York, viii. Career, ix. L.S, x. Century and, xi. Samjung,

The manufacturers from i to iv are Japanese manufacturers, the manufacturers from vi to viii are USA manufacturers, the manufacturers from ix to xi are Korean manufacturers. L.S. is brand of LG group, Korea, and Samjung is brand of Samsun group, Korea.

HVAC electric type, VRV (multi-sprit Type)

- i McQuay, Gree, Media and Haier, Chinese manufacturing production
- ii National, Mitsubishi, Toshiba, Daikin, Fuji, Japanese manufacturing production
- iii L.S Century, Samjung, Kreaan manufacturing production

Further stated that there are categories and cost per refrigeration capacity of A.Cs in Pakistan.

1st Category: USA, European, Japan, if their system is adopted, installation cost will take 5,500USD/ton.

2nd Category: Korea, UAE, Malaysia, if their system is adopted, installation cost will take 4,500USD/ton.

3rd Category: Pakistan, China, if their system is adopted, installation cost will take 3,500USD/ton.

HVACR stated as follows;

People in Pakistan prefer Japanese products due to its high quality. Every constructor wants to install best equipment in their buildings. Similarly, other Chinese or Korean products are also surviving in Pakistan because all people cannot afford the Japanese products.

HVACR stated as follows;

In Pakistan most of commercial buildings, shopping malls are installed HVAC system of various companies, but Japanese and USA's product are considered as top one.

They would also send information of newsletter, magazines to the JST as soon as possible.

Situation for compliance

Pakistan HVACR Society stated as follows;

Adoption of building code of Pakistan (energy provision-2011) is on the development authorities in the Pakistan to enforce it. There must be clear direction to the Architects by all the relevant Authorities that they should make insulation compulsory in the buildings which would save energy and environments.

Pakistan HVACR Society stated as follows;

Three persons of Task Force members are belonging to HVACR, therefore, whenever JST needs any guidance/help from HVACR, they would be available for the noble task.

No.7 Engr. Farhan A. Mehboob
Ex-President, ASHRAE Pakistan Chapter, Karachi

No.11 Engr. Faiz M. Bhutta
M/s Izhar Construction (Pvt) Ltd, Lahore

No.18 Dr.Muhammad Sultan Khan
Associate Professor
Ghulam Ishaq Khan Inst. Of Engineering Science & Technology (GIKI), Topi

MEETING MEMO

Date	6 th August, 2015	Time	11:00 a.m to 12:00 noon
Organization	PEPAC Venue: Rashid Plaza, Blue Area, Islamabad.		
Department			
Attendances	PEPAC: i. Mian Irfan Shaukat Ali, Manager Business Development. ii. Engr. Malik Aamir Abbas, Dy. Manager (S)/Civil Engineer iii. Ms. Hifsa Abid, Architect JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. Profile of PEPAC (Pamphlet) ii. List of PEPAC Project (consisting of 2 papers, A4 size)		
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the PEPAC for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting.</p> <p>JST also discussed that GOP imposed the Energy Provision-2011 against building sector as mandatory basis, which has been implemented since 2014. As detailed rules and penalties were not defined in the provision, such relevant institution and framework must be provided as soon as possible. In addition to non-residence buildings subject to the current provision, GOP is attempting to cover residence-building subject to the energy provision, and to set its criteria.</p> <p><u>Summary of PEPAC.</u></p> <p>PEPAC informed that they will send information by email as soon as possible.</p> <p>1) PEPAC activities:</p> <p>PEPAC informed that PEPAC established by the Government of Pakistan in January 1974, is a Consultancy Firm incorporated as Private Limited Company and provides integrated services at all scale of the built environment. In almost four decades since its birth, PEPAC has become one the foremost Planning, Architectural and Development Consultancy Firms of Pakistan, with a considerable impact on the Nation's urban and rural scene.</p> <p>PEPAC further informed that the firm's professional expertise is marked for its diversity and extensiveness. This is illustrated by the breadth of the work carried out by its professionals; planning inputs at national, regional, urban and rural levels; Katchi abadis (it means slum area in Urdu language.) and slum upgrading; restoration & conservation of historic fabric; physical planning and design of urban infrastructure; architectural design of buildings; structural and environmental engineering; environmental impact assessment; and contact & project management services.</p> <p>2) Organization:</p>		

The organization is administered by a Board of Directors (BOD), which has its Chairman, the Secretary to the Government Pakistan, Ministry of Climate Change, in an ex-officio capacity. The Managing Director is the operational head of the firm, and is appointed by the BOD. The organization has advantages of being owned by the Federal Government, yet operating as a private professional practice and competing with other private sector consultancies in the field.

Any other information about role and activities of PEPAC, they will send by email as soon as possible.

3) Prestigious Projects

PEPAC informed that there are a number of prestigious projects which have been done by PEPAC. List of those projects have been handed over to Kuroki San.

4) Number of staff and organization

Information regarding number of staff working in PEPAC will be sent by email within possible time.

5) Act and By-law

Act and By-laws will also be sent by email under which PEPAC was established.

6) Situation for compliance with Building Code of Pakistan Energy Provision

PEPAC explained that Building Code of Pakistan was designed and prepared by PEPAC in the 1990s. As regards the building code of Pakistan (energy provision-2011), PEPAC knows about these codes but not yet have been implemented.

Green Architectural Planning:

PEPAC stated that they have started new project 'Green Architectural Planning' which will save energy, environment and money for constructors. Details of this project will also be shared by email.

Work of PEPAC

PEPAC informed that major buildings in Islamabad had been designed by PEPAC which includes the building of National Assembly of Pakistan, Supreme Court of Pakistan's buildings etc.

MEETING MEMO

Date	10 th August, 2015	Time	12:30 p.m. to 02:00 p.m.
Organization	Rawalpindi Development Authority (RDA) Venue: RDA Head Office, Liaqat Bagh, Rawalpindi.		
Department			
Attendances	RDA: Mr. Jamshaid Aftab, Director (Metropolitan Planning & Traffic Engineering) JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. Rawalpindi Development Authority Building and Zoning Regulations, 2007.		
Discussed			

Sharing and presentation of Draft progress report.

JST thanked the RDA for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting. It was also discussed that ENERCON and PEC both organizations are our counterpart agencies in this project.

Situation/confirmation of implementation of building codes by RDA.

(1) Functions and role of RDA

Mr. Jamshaid, Director (Metropolitan Planning and Traffic Engineering), RDA discussed and explained the functions of RDA. He said that this Authority may exercise such powers and take measures for development of both public as well as private building. Details follows:-

- Plan, Guide, Control and Implementation Short and Long Term Development Projects including Traffic study, Planning, Design and Preservation of Traffic & Transportation, Corridors, Roads, Bridges, Industry, Education, Health Planning execution. Etc.
- Building, Land Use Control and urban development plans.
- Launch Housing schemes and other Projects, particularly of the nature of Joint Venture and on BOT basis.
- Approval and Control over Private Housing Schemes and all sort of others development.
- Preservation and Improvement of Environment.
- Land Development and Estate Management.
- Evolve policies and Plans including their implementation.
- Provisions and Maintenance of Water Supply, Sewerage and Drainage Services and Solid Waste Management.
- Improvement, Beautification, Operation and Maintenance of Parks, Playgrounds, Major Roads, Advertisement Hoardings etc.
- Take any steps or adopt any measures for the face lifting and beautification of the area. Acquire property, both movable and immovable.

- Sell, Lease, Exchange or otherwise Dispose of any property vested in it.
- Undertake any works and incur any expenditure.
- Procure machinery, instruments or any other material required by it.
- Cause studies, surveys experiments, technical researches or contribute towards the cost of any such studies, surveys.
- Issue interim development order
- Seek and obtain advice and assistance for the preparation of any scheme Establish an Agency/Agencies and entrust to it such powers and functions as it may deem fit with the approval of the Government.

(2) Procedure for construction of new buildings under RDA

1) general procedure

RDA informed that as per their regulations, 2007 anybody who intends to construct his/her home under the area of RDA can apply and shall get certification in two stages. First is drawings certification and drawings shall be submitted to RDA prior to start of construction work at the selected land. Thereafter, RDA may give approval after duly checking that the drawings have been prepared in compliance of RDA Regulations, 2007. Second the completion certification is done only after inspecting the building and making sure that it has complied with the RDA Regulations, 2007 in true letter and spirit. Larger buildings may have more inspection during construction.

Further, building inspectors of RDA usually inspect the site and see that the construction is carried out in accordance with the approved plan and regulations. If not complying with regulations, RDA may direct constructor to comply with the regulations.

2) High rise building procedure (Joint Certificate of Architect, Resident Engineer and Structure Engineer)

RDA informed that for multi-story buildings and buildings of public assembly, joint certificate from the builder, the Architect, the Resident Engineer and the Structure Engineer as specified at Appendix-B of Regulations, at the following stages:

- i. When construction upto plinth level is completed (see BR-7)
- ii. When construction up to 38 ft (11.58 m) level is completed (see BR-8)
- iii. Upon completion of the building (see BR-9)

RDA further informed that approved building plans are released stepwise for multistory buildings. Following four steps are necessarily followed:

- i. Excavation plan for basement/s including design of restraining structure/pilling etc.
- ii. Basement upto plinth level.
- iii. Upto 38 ft (11.58) Building Height.

iv. Above 38 Ft (11.58 m) Building Height.

(3) RDA regulation.

1) Building and Zoning Regulations, 2007

RDA informed that it has been adopting the Rawalpindi Development Authority Building and Zoning Regulations, 2007 and the same regulations are adopted by other development authorities in the entire Punjab along with TMAs except LDA.

RDA informed that they have been following the building and zoning regulations, 2007 and these codes have also been adopted and followed by all other authorities in Punjab that include Faisalabad Development Authority (FDA), Gujranwala Development Authority (GDA), Multan Development Authority (MDA), Lahore Development Authority (LDA) and Rawalpindi Development Authority (RDA) alongwith all the relevant Town Municipal Administration (TMAs) in the entire Punjab while changing the title of the regulations as their own regulations. HUD & PHED has directed all relevant agencies to follow these regulations in order to unify regulations in the entire Punjab.

Now in the entire Punjab, it's only the Lahore Development Authority (LDA) which has not been following these regulations since 2014 because they have amended these regulations as per their own need and have been following the latest regulations of 2014. Pertinently, LDA was also following these regulations prior to its new regulations, 2014.

2) Adoption of LDA Regulations 2014 in RDA.

RDA informed that in order to unify and adopt the latest regulations, they have requested the HUD & PHED for amendment of RDA Regulations, 2007 and adoption of LDA Regulations, 2014. RDA further informed that now the Government of Punjab vide their letter dated 29th July, 2015 replied that kindly place such a proposal before the Governing Body of RDA for adoption of the latest regulations 2014 of LDA.

RDA further stated very soon after fulfilling all procedures, they are going to adopt the LDA Regulations, 2014.

3) Discussion of Seismic Provision

RDA informed that seismic provision is solely responsibility of structure engineers shortlisted/selected by RDA and registered with PCATP. These provisions are considered by the structure engineers while designing the building structure. RDA has explicitly mentioned in its Regulations, 2007 (Chapter No.7) the responsibility of structural engineer. RDA mentions:

4) Structural/Engineering Design:

a) Basic loads to be considered in Design: Following loads shall generally be taken into account by the structural engineer, as a minimum:

i. Dead loads

- ii. Live loads
 - iii. Earth pressure
 - iv. Pressure of water and other liquids
 - v. Wind loads, where they govern the design
 - vi. Seismic loads
 - vii. Such other loads as are relevant.
- b. Additional Loads to be included in special cases: Following loads shall additionally be taken into account, where there is reasonable probability of their occurrence or in cases where the applicable codes require that they also be considered:
- i. Explosion (use the specific risk specified)
 - ii. Impact (use the specific risk specified)
- i. Influence of equipment (use the specific characteristics of the equipment intended to be JST discussed the case of Japan and stated that Japan has categorized buildings into eight typical categories as follows:
- ii. Removal of support (use the specific facts of the case and only when undertaking modification of an existing building)

5) Compliance to Design Codes:

- a) The structural design of buildings shall meet the requirements of the current edition of the following design codes:
- i. Uniform Building Code, 1997 Edition, International Conference of Building Officials, USA.
 - ii. International Building Code, 2006 Edition, International Code Council, USA.
 - iii. Building Code Requirements for Structural Concrete (ACI 318-99) and Commentary (ACI 318 R-99), American Concrete Institute, USA.
- b) The geotechnical investigations shall be done in the light of the specific details of the building, the order of the loads and special requirements, if any. The scope and quantum of testing shall be consistent with the applicable parameters of the project.

(4) Procedures of formulation of RDA regulation.

RDA has its Governing Body that can recommend regulations to the Housing, Urban Development & Public Health Engineering Department, Government of Punjab, Lahore for adoption of the codes. If HUD&PHED approves the codes, it shall be implemented by all the relevant development authorities and TMAs.

(5) Barrier that RDA is facing at the moment.

RDA informed that 340 square km area directly come under the domain of RDA and it has only four building inspectors, two Assistant Directors, one Deputy Director and one Director to inspect and approve the building plans of the entire area. It is really insufficient number of staff in the Metropolitan & Traffic Engineering Wing of RDA.

Implementation system regarding Building Code

(1) Human resource of inspection department for Building Code

RDA shared the following information:

- Four building inspectors, two Assistant Directors, one Deputy Director and one Director are working
- Qualification of inspector is DAE 3 years.
- RDA receives application annually 700-800.

(2) Diagram inspection

RDA does not implement diagram inspection.

(3) Site inspection:

- Four inspectors are working
- Qualification of inspector is DAE 3 years.
- RDA receives application annually 350-400.

BCP-EP-2011.

RDA informed that RDA does not have such information of building code of Pakistan (energy provision-2011) prepared by Pakistan Engineering Council and nor they have yet received any direction from the relevant provisional department i.e. HUD & PHED being an administrative body which governs all the Development Authorities in Punjab.

RDA assured that they will write to the Secretary, HUD&PHED with reference today's meeting for adoption of BCP-EP-2011, if the above department agrees/approves, RDA will adopt the BCP-EP-2011.

Arrangement of Seminars, Joint meetings etc

RDA suggested that JST in collaboration with the counterpart ENERCON and PEC should arrange seminars, conferences and meetings wherein the Architects, Structural Engineers and other technical persons can be educated and convinced to adopt BCP-EP-2011 Code for energy efficiency and conservation in the building sectors of Pakistan because they are the professionals who design the buildings.

Departments involved in development of major cities:

RDA informed that there are following major departments/agencies involved in the development of major cities:

- i. **Relevant development authorities (FDA, RDA, GDA, LDA and MDA).** These authorities are directly controlled by HUD&PHED.
- ii. **Cantonment boards** (This organization does not follow the RDA Regulations, 2007 because it has its own regulations in the cantonment areas). Cantonment Boards are directly controlled and monitored by Military.
- iii. **Town Municipal Administrations (TMAs):** It exists where no development authorities work.
- iv. **Punjab Housing & Town Planning Agency (PHATA)**

All above mentioned agencies except Cantonment Boards and LDA are following the Rawalpindi Development Authority Building and Zoning Regulations, 2007.

Energy efficiency and conservation in Punjab

RDA shared Government of Punjab, Local Government & Community Development Department's letter No.SO.TMA-Dev(LG)9-78(Solar)2012 dated 3rd October, 2013 under which it had been conveyed the approval of the Chief Minister of Punjab that:

- i. Street lights and public lighting in all existing private housing schemes, new housing schemes and commercial buildings be switched over to LED.
- ii. The existing lighting in Government Offices, Public Sector buildings, schools, hospitals, commercials and residential buildings be switched over to LED or energy saver.
- iii. Timeframe for conservation of lights in to LED was given 6 months for its implementation.

Pakistan Council of Architects and Town Planners:

RDA informed that there is an institution namely Pakistan Council of Architects and Town Planners which has wide ranging powers and is authorized to perform all functions and to take steps connected with or ancillary to all aspects of the two professions including laying down standards of conduct, safeguarding interests of its members, assisting the Government and national institutions in solving national problems relating to the professions, promotion of reforms in the professions, promotion of education of these professions, reviewing and advising the Government in the matter of architecture and town planning education. RDA advised to meet this organization then this organization will automatically suggest the Government of Pakistan for adoption of these codes in true letter and spirit.

Introduction of HUD & PHED and LG&CD.

RDA informed that there are two relevant provincial departments which govern the autonomous bodies working under their control

- i. **Housing, Urban Development and Public Health Engineering Department:** This department is provincial Punjab Government Department which governs all development authorities in Punjab

being an administrative as well as policy making body.

- ii. Local Government & Community Development:** This is Provincial Government Department which governs the all Town Municipal Administration (TMAs) in Punjab

Adoption of BCP-EP-2011 of PEC

RDA informed that they will write letter to Secretary HUD &PHED with reference today's meeting for adoption of these codes, if the Government of Punjab pays attention on this, it can be adopted and applied in the building sector in RDA.

MEETING MEMO

Date	11 th August, 2015	Time	03:00 p.m. to 04:15 p.m.
Organization	Bahria Town, Islamabad Venue: Bahria Town, Head Office, Phase-VIII Islamabad.		
Department			
Attendances	Bahria Town: Amreena Asif, Chief Architect JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Bahria Town SOP, 2013-2014		

Discussed

Sharing and presentation of inception report.

JST thanked the Bahria Town for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting.

Summary of Bahria Town

1) Mission

Bahria Town aspires to be Pakistan's greatest builder of all times, with projects offered to an eclectic mix of segments, at choice locations with world class amenities, while ensuring the highest international standards, timely delivery, and lifelong customer satisfaction.

2) Vision

To build the future, Bahria Town needs ideas, the free flow of those ideas, and the effective use of human power and technology to shape those ideas into life changing ground realities. Globalization makes all this ever more possible and easier, since the landmarks in luxury lifestyle around the world, that took centuries to be built and perfected, are the priceless jewels of their inspiration. Yet, there is much more to be achieved, many novel ideas to be conceived, and a great many horizons waiting to be discovered.

Projects of Bahria Town

1) Square of area and number of housing and the other of kind of building

Chief Architect stated that information regarding square of area and number of housing is not available with her. Such information can be got from the Corporate Office of Bahria Town. Mr. Shahzad whose number is 0300-5009999 can provide such information being relevant person.

2) Sales price per square of floor

Chief Architect stated that information regarding price is not available with her the same can be got from the Corporate Office of Bahria Town. Mr. Shahzad whose number is 0300-5009999 can provide such information being relevant person.

3) Standard purchasing procedure

Standard procedure is as follow:

- Client purchases plot from Bahria Town
- Bahria Town designs the house.
- Clients go to RDA for approval.
- Building Control Department of Bahria Town monitors all activities.
- Bahria Town issues completion certificate.

4) Loan for customer

Chief Architect stated that information regarding loan for customer is not available with her. Such information can be got from the Corporate Office of Bahria Town. Mr. Shahzad whose number is 0300-5009999 can provide such information being relevant person.

5) Annual investment for maintenance and additional cost for enhancing your buildings

Bahria Town informed that they have their own staff for the maintenance of houses in the Bahria Town projects. Residents of Bahria Town has to pay monthly fee of Rs.3000/- (depending upon the size of house, if size of house is big, then fee will be doubled) on account of maintenance charges, road cleaning, electricity problem solution, gas problem solution and so on all the facilities are provided to the clients in response of payment of fee.

6) The other additional information

Ms. Armeena Asif, Chief Architect (Residential Area) informed that there are two kinds of Bahria's projects:

- i. Private (people buy plot from Bahria Town. Bahria Town just designs the plot and gives to the owner and owner hires constructor for construction of house)
- ii. Bahria Town's own (Bahria develops the plot and construct houses of different sizes i.e. 5 marllas, 8 marllas, 10 marllas and one canal and then handover to the clients)

In Islamabad, following projects of Bahria Town. Few projects are under process but others have been completed successfully.

1. The Sanctuary
2. Bahria Greens
3. Bahria Enclave Apartments
4. Bahria Enclave Islamabad
5. Bahria Town Rawalpindi
6. Safari Villas
7. Bahria Garden City Zone 5
8. Meadows
9. Phase-9
10. Phase 1-7
11. Phase-8
12. Phase-8 Extension
13. Bahria/Safari Homes
14. Awami Villas

15. Bahria Heights
16. Executive lodges
17. Overseas Enclave
18. Safari Apartments
19. Safari Valley
20. Safari Valley-Rafi Block
21. Safari Mall
22. River view commercial
23. Civic Center

Similarly in Lahore and Karachi, there are a number of projects going on.

IPP project

Bahria Town has its own generation plan. Details of which can be got from Mr. Kamal who is dealing with electricity matters of Bahria Town. His contact number is 0322-8567783. Another meeting can also be fixed with him for fathering information regarding energy.

Operation and Maintenance

Bahria Town has its own staff for providing services of maintenance to the residents of Bahria Town subject to fee of Rs.3000/-. This fee is doubled in case the plot size is bigger.

Information regarding manufacturers

It was informed that choosing of A.C, motors, lighting and fan is entirely depend on the clients. Whatever the clients want, they purchase appliances from the market.

Competitors of Bahria Town

Bahria Town informed there is no competitor of Bahria Town but there are some partner organisations like DHA.

Awareness of consumer

Bahria Town discussed that it is basic responsibility of Government of Pakistan to educate the people and relevant organisations for adoption of necessary measures for energy efficiency and conservation in the building sector of Pakistan. The development authorities working under control of Government and it can clearly direct the authorities for enforcement of energy efficient material for building sector in Pakistan.

Regulation of Bahria Town

Bahria Town has its own Standard Operating Procedure (for designing, execution, monitoring & operations of buildings) 2013-2014. These regulations are truly implemented in Bahria Town

Building code of Pakistan (energy provision-2011)

Bahria Town does not follow building code of Pakistan prepared by Pakistan Engineering Council, Islamabad. They follow their own SOP 2013-2014 and RDA Regulations, 2007

Idea of Bahria Town to improve energy efficiency and conservation in the building sector

Bahria Town stated that improvement in energy efficiency and conservation in the building sector is very

much essential and it can be improved while using energy efficient material e.g. double glass window, cavity wall, roof top insulation (it maintains temperature). If the clients want, they provide them such facilities but most of the people do not want such facilities.

Relationship of Bahria Town with RDA

Chief Architect informed that Bahria Town is following the RDA Regulations, 2007. For construction of house in Bahria Town, at first Bahria Town gives NOC to the owner and then drawings are submitted to RDA by the owners for approval. Bahria Town has Building Control Department (BCD) which supervises/monitors the buildings/houses and sees that houses are constructed in accordance with the approved plans. BCD finally issues completion certificate, if the client does not follow the approved plan, BCD does not issue completion certificate.

BAHRIA TOWN'S PARTERS:

S.No	Name of Partnership Org.	Website of Org.
1	Starwood Hotels & Resorts	http://www.starwoodhotels.com
2	OJMR-Los Angeles	http://www.ojmrarchitects.net/
3	DHA Islamabad	http://www.dhai.com.pk
4	Areaa Construction	http://www.areaa.com.tr
5	TAK	http://www.tak.com.my/
6	Halcrow Pakistan	http://www.halcrow.com
7	WSP	http://www.wspgroup.com
8	Habib Rafique Limited	http://www.habibrafiq.com/group/hrl/index
9	Skyways	http://www.skywaysgroup.com
10	PGS	http://www.pgs.com/
11	Wilson Associates	www.wilsonassoc.com
12	Cracknell	www.cracknell.com
13	CEA	www.colinevans.com.br
14	Ground Floor Engineering	www.groundfl.com
15	Beame Architectural Partnership	www.bapdesign.com

MEETING MEMO

Date	11 th August, 2015	Time	11:00 a.m. to 12:30 p.m.
Organization	EMAAR Islamabad Venue: EMAAR Canyon Views, Islamabad.		
Department			
Attendances	EMAAR: <ul style="list-style-type: none"> i. Mr. Wazirzada M. Owais, Director Legal Contact and Company Secretary. ii. Mr. Abbas RReza Jaffery, Manager Development. iii. Mirza M. Waseem Khan, Manager Projects. iv. Syeda Zainab Azam, Executive. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Pamphlet of EMAAR Canyon views project Islamabad.		
Discussed	<p><u>Sharing and presentation of Draft progress report.</u></p> <p>JST thanked the EMAAR for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting. It was also discussed that ENERCON and PEC both organizations are our counterpart agencies in this project.</p> <p><u>Summary of EMAAR company.</u></p> <p>(1) EMAAR's role and functions EMAAR Pakistan's path-breaking initiative of ushering in a distinctive lifestyle to the country is now a benchmark for modern community living. Discerning customers now have the option of choosing a living and workplace environment that truly reflect their personality.</p> <p>The basic philosophy of EMAAR in creating these dynamic neighbourhoods is to ensure integrated lifestyle environments for residents. The operative word is "integrated" with EMAAR creating self-sustaining communities that feature the array of amenities that add to the quality of living.</p> <p>From a modern family's perspective, an urban lifestyle environment must feature educational institutions for the children, healthcare facilities for all, leisure and retail choices, entertainment options, fitness facilities and a sense of community living with a vibrant community centre.</p> <p>Emaar's "designer" communities offer all these advantages to residents. This approach of EMAAR to create a new lifestyle has been one of the catalysts of the property boom in Dubai, the company's home market. EMAAR's master-planned communities in Dubai are home to several Pakistani expatriates, who value to the convenience and luxury offered within the neighbourhood.</p> <p>(2) Projects of EMAAR</p> <p>JST requested to know the projects of EMAAR. At first participants of the meetings informed that they would provide information to JST but some information they cannot share due to business information. However, such information can also be shared only after getting approval from the top management of EMAAR.</p> <p>EMAAR stated that they have only two projects namely Canyon views in Islamabad and Crescent in Karachi. Basically it is EMAAR's initial stage in Karachi thus they cannot share information of square of area and</p>		

number of housing but in Islamabad it has completed one village of houses and handed over to the clients. In Islamabad, EMAAR is carrying out horizontal approach for construction of houses while in Karachi its higher upto 26 floor building which is presently under construction.

(3) EMAAR working under DHA

EMAAR stated that it has been falling under the domain/jurisdiction of Defence Housing Authority (DHA) specifically and DHA generally comes in the jurisdiction of CDA being the capital area of Islamabad. EMAAR has its collaboration with DHA Islamabad (Canyon Views) and similarly in Karachi (Crescent Bay).

(4) DHA and EMAAR's partnership

EMAAR stated that they receive land from DHA being a Master Developer of the area and EMAAR gives application to DHA for construction of house. DHA statute passed by the parliament gives power to DHA as regulator. If there is any conflict between CDA and DHA regulations, then only CDA regulations will prevail.

(5) EMAAR's Project in other countries

EMAAR stated that it has been working in 17 countries (in 36 cities) all over the world. Burj Khalifa Building in Dubai is the landmark of EMAAR.

EMAAR project in Pakistan.

(1) Square of area and number of housing and the other of kind of building

EMAAR promised that EMAAR would share such information later.

(2) Sales price per square of floor

EMAAR stated that EMAAR can not open to cost and price information.

(3) Standard purchasing procedure

All transactions of purchasing house in EMAAR are dealt through the designated bank and EMAAR does not have any loan offer/facility for the clients in Pakistan. EMAAR provides payment plan to the clients, if the client wish to pay entire amount its fine if he does not pay and requests for instalments, they can make payment plan in instalments keeping in view of the situation of the plot's size and demand. For the horizontal houses, it's the banks which are giving loan to our customers and EMAAR's customers are in Saudi Arabia, Europe, America etc.

(4) Loan for customer

EMAAR promised that EMAAR would share such information later.

(5) Annual investment for maintenance and additional cost for enhancing EMAAR's buildings.

EMAAR informed that they have facility of maintenance in Islamabad's Project because of living community and the per household pays annual fee of Rs.80,000/- on account of house maintenance, road cleaning, electrical problem solution, electricity problem, gas problem, telephone problem and so on all these facilities are provided to the clients in response of payment of fee. But in Karachi's project, its initial stage there is no such facility. However, with the passage of time all such facilities would be provided to the customers.

Operation and Maintenance

EMAAR informed that they do have their own staff for the maintenance of houses in the Canyon Views Islamabad. They have already hired the Consultant Firm namely Power Consulting which is licensed by WAPDA for designing and to work out the loads required and then would give idea. EMAAR is also looking for establishment of its own grid Station in Islamabad.

Information regarding manufacturers

EMAAR stated that :

- Presently the people prefer the DC Inverter A.Cs because it only takes 120-160 loads while the conventional A.C cannot work on fewer loads.
- Motors are not so familiar, but they are using Water Pumps.
- Elevators not this moment because in Canyon Views Islamabad they have horizontal approach.

Competitors of EMAAR

EMAAR stated that there are following competitor of EMAAR:-

- i. Bahria Town
- ii. Al-Ghurair Giga (This group is constructing the World Trade Center in Islamabad)

Awareness of consumer

EMAAR stated that it is very much important to educate the people in Pakistan of using energy efficient products and particularly energy efficient material for building sector in Pakistan. All the development authorities in Pakistan should be directly by the Government of Pakistan for enforcement of energy efficiency in the building sector of Pakistan.

Building standards of EMAAR and PEC Building Code of Pakistan (Energy Provision-2011)

EMAAR informed that they have been following the international standards which no other developers follow in Pakistan while other development authorities follow minimum standards of building in Pakistan. Further stated that Building Code of Pakistan (Energy Provision-2011) prepared by Pakistan Engineering Council are not mandatory for them because they are already following the international standards which are higher than these standards.

Regulation of EMAAR

EMAAR informed that they follow their own regulations for building sector in all the countries including Pakistan. They are using double glazed window.

Idea of EMAAR to improve energy efficiency and conservation in the building sector

EMAAR stated that improvement in energy efficiency and conservation in the building sector cannot be done by one group or developer. It can be done by country (Government of Pakistan). If the Government

takes very keen interest, it can clearly direct all the development authorities to build open space in the houses, cross ventilation, air cavity or insulation. Median campaign, seminars, conference countrywide must be initiated to educate the people, developers, architects, engineers, development authorities etc. For that purpose, there needs to be some incentives to the general public as people cannot afford. It is trend in Pakistan people do not look on long time solution and they go for easy way and cheapest way. If the BCP-EP-2011 is made mandatory and accordingly enforced by the relevant development authorities in Pakistan, it would save lot of energy.

Generation of own electricity

EMAAR stated that they wanted to generate their own electricity and distribute to their clients but it was the restriction of NEPRA because the Electricity Distribution Companies in Pakistan severely denied to not providing license to any private firm for generation of electricity. Its only one organisation that is Bahria Town, Islamabad which got license from the Government of Pakistan for generation of electricity. Bahria Town has been generating the electricity as its own but there are few court cases against Bahria Town in the court of law.

Due to energy crises in Pakistan, generally every household has either generator or UPS. UPS is more popular than generator due to no noise and affordable price.

MEETING MEMO

Date	12 th August, 2015	Time	03:30 p.m. to 04:00 p.m.
Organization	NEPRA Venue: Head Office G-5 Islamabad		
Department			
Attendances	NEPRA: i. Mr. Zaighum Hussain, Sr. Advisor Technical ii. Engr. Shahzad Anwar, Assistant Director JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		

Discussed

Introduction and presentation of inception report.

At the inception, JST thanked the NEPRA for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.

Electricity Tariff

NEPRA informed that tariff structure present by JST is correct. However, NEPRA is working for 2015 tariff and latest tariff has not been finalized and notified. They will provide the latest tariff to JST after finalization as quickly as possible.

Procedure of application of electricity contract

NEPRA informed that they have two standardized documents approved by NEPRA:

- i. consumer eligibility criteria (rules): these rules will be supplied to JST by email as soon as possible. (Not received)
- ii. Consumer Service Manual for Distribution Companies: this document can be got from any distribution company. They suggested it is better to ask the MoWP or ENERCON to get such document from IESCO or any company.

Number of Contract by sector.

NEPRA informed that they do have the latest data of number of contract by sector. They have written letters to the all distribution companies for such data. Such data has not yet been sent by Discos. However, target date of data submission is 30th September, 2015, thereafter, NEPRA will provide data to JST. But at the same time, Ministry of Water and Power have such data that can be got from them.

Peak time and peak Demand.

NEPRA informed that now they have flat curve showing the percentage of peak time and demand. They will provide necessary information of weekly, monthly and yearly data to JST by email.

Energy consumption on typical building and dwelling

NEPRA informed that NEPRA did not have such information.

Procedure and requirement of license grant of electricity distributor, electricity generator

1) Distributor license

NEPRA informed that they have 10 distribution companies within them one Bahria Town (small generator) is existing. Previously, Bahria Town was operating as consumer but later on was granted license to generate electricity and sell it to distribution company.

Further informed there is two categories of generators:

- i. Generators who generate electricity and use for only themselves. Such generator are not granted license from NEPRA.
- ii. Generators who generate electricity and sell it to distribution companies are required to get license from NEPRA

2) Generator license

NEPRA informed that any generator can apply on the form of NEPRA for grant of license then NEPRA advertises their request in the national newspaper stating that this company has applied for grant of license. All the stakeholders and relevant organisations comment on this advertisement. Based on comments of the people/organisations, NEPRA conducts public hearing wherein all individuals, companies, organisations participate and give their view point and support. Proceedings of public hearings are recorded. After detailed analysis NEPRA either grants or declines the license. After completing such procedures, NEPR A puts all information at its website for information of the general public.

MEETING MEMO

Date	13 th August, 2015	Time	11:00 a.m. to 12:00 noon
Organization	Construction Technology Training Institute (CTTI) Venue: CTTI Office, Sector I-12, Islamabad		
Department			
Attendances	CTTI: <ul style="list-style-type: none"> i. Mr. Ejaz Hussain, Director ii. Raja Humayun Gohar, Training Officer iii. Mr. Tahir Imran, HOD General Department iv. Mr. Altaf Qadar Bajwa, HOD Civil Department. v. Mr. Muhammad Ejaz, HOD Mechanical Department vi. Mr. Iftikhar Hussain, HOD Auto and Diesel Department. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	<ul style="list-style-type: none"> i. CD containing presentation. ii. Brochure of CTTI 		
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the Construction Technology Training Institute (hereinafter referred to as “CTTI”) for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.</p> <p><u>Presentation about CTTI</u></p> <p>With using power point (JST obtained it from CTTI), CTTI given presentation about CTTI and informed that it was established in 1986 with the help of Government of Japan and was formally inaugurated in 1989. During its last 27 years the Institute has made tremendous contributions in socio-economic development of Pakistan through imparting quality Technical Education to its youth and their skill development. CTTI is offering three years diploma of Associate Engineer in Mechanical (with specialization in construction machinery) is not run anywhere in the world except CTTI. This institute is recognized worldwide and its students are performing very well in different multinational companies in the world.</p> <p>(1) Controlling Orgs</p> <p>CTTI is directly financed by the Ministry of Communication (hereinafter referred to as “MoC”) and administratively controlled by Frontier Works Organization (hereinafter referred to as “FWO”).</p> <p>(2) Affiliation</p> <p>CTTI is affiliated with the Punjab Board of Technical Education, Government of Punjab.</p> <p>(3) Faculty member</p> <p>Mr. Ejaz, Director of CTTI informed the faculty as follows:</p> <ul style="list-style-type: none"> i. Mr. Ejaz Hussain, Director ii. Mr. Mohabat Khan, Chief Instructor iii. Mr. Asmat Shakeel Khattack, Admin Officer iv. Mr. Raja Humayun Gohar, Training Officer v. Mr. Altaf Qadar Bajwa, HOD Civil vi. Mr. Muhammad Ejaz, HOD Mechanical vii. Mr. Iftikhar Hussain, HOD A&D 		

- viii. Mr. Tahir Imran, HOD General
- ix. Instructors and Sub Instructors 110.

(4) Board of Management of CTTI

Following are the Chairman, Members and Observer of Board of Management:

- Secretary/Additional Secretary, Ministry Of Communication is Chairman
- Director General FWO, Member
- Director General NLC, Member
- Chairman, NHA, Member
- Director General, NTB, Member
- Joint Secretary (II), Ministry Of Communications, Member
- Financial Advisor (C), Ministry Of Communications, Member
- Chief Transport and Communications Officer (PLANNING DIVISION), Member
- Director, CTTI, Member
- Representative, All Pakistan Contractor’s Association, Member
- Representative of Japan International Cooperation Agency, Observer

(5) Human Resources

CTTI is administratively controlled by Headquarter FWO. All issues related human resources are dealt through Headquarter FWO Human Resource Directorate

(6) Finance (budget)

Development / Non Development Budget is allocated by MoC.

Organization of CTTI

Director CTTI informed that organisation chart described on agenda is correct.

Role of CTTI

CTTI informed the role department wise as follows:

Department	Role
Mechanical	To conduct DAE Mechanical (3 years) and 4 x short courses related to Mechanical Technology.
Auto and Diesel	To conduct DAE Auto and Diesel (3 years) and 3 x short courses related to Mechanical/Auto & Diesel Technology
Civil	To conduct DAE Civil and Quantity Surveyor (3 years) and 17 x short courses related to Civil Technology
General	To support all other departments. Subjects common to all other departments like Match, Physics, Chemistry, English, Islamiat, computer etc are conducted by this department Computer Software and hardware Courses of 3 months duration also conducted by General Department.

Curriculum of CTTI:

CTTI informed that Curriculum and lectures of energy efficiency and conservation are not included in Syllabus of DAE Civil, QS, Mechanical and Auto & Diesel Courses being taught at CTTI.

Curriculum for Building Code:

CTTI informed that CTTI do not provide curriculum for Building Code.

Collaboration with PEC for the education system of building code of Pakistan.

CTTI informed that they have no collaboration with Pakistan Engineering Council because they have running only diploma and short courses, hence, no collaboration is required.

Collaboration with ENERCON for the education of energy system engineering program related to energy efficiency and conservation (EE&C)

CTTI has no collaboration with ENERCON. Director, CTTI informed that this is first time he is seeing the organization of ENERCON.

Current relations of CTTI with Govt. of Pakistan and JICA

CTTI informed that as the Institution was established by Government of Japan and so far their Japanese Friends have been released more than Rs.1.5 Billion for its expansion / up gradation, their recent projects for CTTI are:-

- Industrial Products as Grant in Aid Project: Latest industrial equipment worth Rs, 202 M was provided by Government of Japan as grant in -aid project in 2012
- The Project for Capacity Building in CTTI. Project for revision of syllabus of 5 x short courses including equipment with estimate cost of Rs 320 M approved by JICA and R/D was signed on 7 May 2015.

Necessary Information

JST asked following information from CTTI.

Curriculum, skills and number of students of CTTI:

- Hard and soft copy of Curriculum has been provide to JST.
- Numbers of Students under training are:-
 - DAE Courses - 692
 - Short Courses - 775

Curriculum regarding EE&C

CTTI informed that no curriculum as Energy System Engineering Program is being conducted in CTTI.

EE&C discussion

Director, CTTI discussed and suggested that energy efficiency and conservation directly comes on the shoulder of all relevant development authorities and the designers, architects and structural engineers. Therefore, if Government of Pakistan makes such Building Code of Pakistan (Energy Provision-2011) (hereinafter referred to as “BCP-EP-2011”) mandatory and clearly directs the relevant organizations for enforcement in true letter and spirit, it would be easily implemented.

All technical education imparting universities should also involve through Higher Education Commission of Pakistan (HEC) in order to add energy efficiency and conservation program in curriculum.

He further suggested that national level seminars, workshops, conferences should be arranged wherein all stakeholders should gather under one roof by this way, all participants could easily be educated.

BCP-EP-2011 prepared by Pakistan Engineering Council has also been given to Director, CCTI. Director informed that they will try to add energy efficiency and conservation curriculum in their education institute.

At the end, he assured CTTI support to JST and stated that they welcome the JST any for such a good initiative.

MEETING MEMO

Date	17 th August, 2015	Time	11:00 a.m. to 01:00 p.m.
Organization	Defence Housing Authority, Islamabad-Rwp Venue: DHA Head Office, Phase-II Islamabad.		
Department			
Attendances	DHA: <ol style="list-style-type: none"> i. Brig. Qaiser, Administrative. ii. Brig. Muhammad Saeed Qadir, Chief Engineer iii. Col. Nasir, Director (Tech) iv. Mr. Wisal, General Manager (Quality Assurance) JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		
Discussed	<p><u>Sharing and presentation of inception report.</u></p> <p>JST thanked the DHA for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan. It was also discussed that ENERCON and PEC both organizations are our counterpart agencies in this project.</p> <p><u>Discussion on energy efficiency and conservation</u></p> <p>Administrative of DHA welcomed JST and stated that DHA is primarily a private housing society. They set out by-laws and set town planning where 60% people from civilian and 40% people from army (retired) are living. They follow Government of Pakistan's building code and develop their own by-laws. Therefore, it is more appropriate to say that DHA is just authority to control the building construction.</p> <p>Administrative further stated that they are ready to provide all necessary information sought by JST. But he emphasized that what in return DHA will get from JST after providing such information. JST informed that at this stage, we are carrying out survey for promotion of energy efficiency and conservation in building sector of Pakistan. It is pre-condition for loan by the international donors e.g. JICA, ADB, WB.</p> <p>He further discussed and explained that DHA is getting electricity from distribution company. He said we received electricity at the DHA, then they distribute energy by their own distribution mechanism. energy efficiency and conservation can be done by Architects while designing houses energy efficient.</p> <p><u>2. Overview of recent projects and trend</u></p> <p>JST requested the DHA to know the latest project including the following information with respect</p>		

to the projects especially the efforts made by DHA for promotion of energy efficiency and conservation in the building sector.

- 1) DHA phase I,
- 2) DHA phase II,
- 3) DHA phase III,
- 4) DHAI APS Sector and,
- 5) DHAI APS Flagship Campus Sector
- 6) If you carried out another projects.

During the meeting they promised to provide such information either by email or by courier service to the JST as soon as possible. (received)

3. Regulation of Islamabad DHA, Lahore DHA, and Karachi DHA

JST informed that it understands that DHA has different regulations apart from building construction regulation by local government and requested to know the current situation.

At first, DHA informed that it is an independent authority and they follow the international standards for construction of houses/buildings in DHA. Further stated all other DHAs e.g. Lahore and Karachi have their own regulations more or less similar to DHA Islamabad. They promised to provide DHA regulations either by email or by courier service as quickly as possible. (received)

4. Implementation system regarding Building Code

JST requested to know the following information

Does DHA have inspection system on the building construction?

- 1) Human resource of inspection department for Building Code

How many inspectors are in inspection department? (received)

Share License, degree and experience of Inspectors (Not received)

How many applications come annually, averagely? (Not received)

This information will be provided by either email or courier service very soon

- 2) **Diagram inspection**

How many inspectors are concerned in diagram inspection?

Share License, degree and experience of Inspector (Not received)

How many applications came latest half year? (Not received)

Please let us know Attention point on the inspection. (Not received)

This information will be provided by either email or courier service very soon

- 3) **Site inspection**

Same question as diagram inspection. (Not received)

This information will be provided by either email or courier service very soon

5. Building specification, cost, buyers preference

JST requested to know DHA's own specification on the building design apart from CDA regulation, RDA regulation and SBCA regulation. It was also requested to provide following information.

- 1) Material and thin of roof, wall and windows, (Not received)
- 2) Energy performance of lighting appliance, (Not received)
- 3) Energy performance of air conditioning appliance, (Not received)
- 4) Energy performance of lift equipment and, (Not received)
- 5) Energy performance of motor and transformer appliance (Not received)

This information will be provided by either email or courier service very soon

6. The maintenance of the building

JST requested to know that after completion of building construction, who has responsibility to operate and maintain on the buildings.

Chief Engineer, DHA informed that they have their own staff for maintenance of building/residential houses in all phases of DHA Islamabad for which they charge Rs.1500/- per month to every household on account of maintenance of security, garbage collection, cleaning roads, plumbing services etc.

7. The difference from Private Sector

DHA informed that it is parallel organization to Bahria Town but independent to make its decisions. Following categories of people are living in DHA, Islamabad.

60% civilian people/businessman/retired or serving in various department

40% retired military people

8. BCP-EP-2011

JST requested to know the adoption of building code of Pakistan (energy provision-2011) by DHA. They stated that they do not know about PEC latest regulations. However, if the government of Pakistan makes it mandatory and directs all the authorities for their enforcement, then DHA will also follow BCP-EP-2011. However, DHA is also constructing the houses energy efficient while maintain the ventilation, heating and cooling system in the houses.

8. The necessary information

JST requested to know about following information:

- 1) Organization chart including number of staff of DHA Islamabad. (Obtained.)
- 2) The relationship between the Government and DHA and Organization Chart (Obtained.)
- 3) Information of DHA phase I, DHA phase II, DHA phase III, DHAI APS Sector, and DHAI APS Flagship Campus Sector (Obtained.)
- 4) DHA building code or the regulation of DHA (Obtained.)

- 5) DHA building application form and list of drawing/ specification (Obtained.)
- 6) Any check list used by building inspector Obtained. (Obtained.)
- 7) Legal evidence of procedure of formulation of DHA building code. (Obtained.)
- 8) Number of human resource for building approval process. (Obtained.)
- 9) Detailed process and document for building approval process (Obtained.)
- 10) Detailed information for review process for BCP-SP-2007
- 11) Information of DHA Lahore and DHA Karachi
- 12) Legal evidence of procedure of building permission of DHA. (Obtained.)

MEETING MEMO

Date	17 th August, 2015	Time	03:00 p.m. to 04:00 p.m.
Organization	Pakistan Public Works Department Venue: Pak PWD, G-9 Mauve Area, Islamabad		
Department			
Attendances	Pak PWD: i. Mr. Safdar, Chief Engineer (North) ii. Mr. Zahid Hassan Khan, Senior Architect. JST: Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	None		

Discussed

Sharing and presentation inception report

JST thanked the Pak PWD for arrangement of the meeting within short span and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan. It was also discussed that ENERCON and PEC both organizations are our counterpart agencies in this project.

General information of Pak PWD

1) Activities of PWD

JST requested the Chief Engineer to confirm the summary of Pak PWD, he replied and explained the following:-

Summary of PWD

	Summary
Mission (Aim)	To execute office and residential buildings federally funded project except for those of Defence.
Vision (Objective)	To execute the offices and residential accommodation for federal Government employee and to overcome the backlog of millions of square foot of office space.
Scope	a) Public Sector Development Programme: He stated 36-37 federally funded PSDP project are going to started in the financial year 2015-2016 b) Deposit Works: He stated they have 103 buildings under deposit work. c) Maintenance: He stated they carry out maintenance of 131 office buildings and 16000 residential houses/apartments
Function	a) Acquisition and development of Federal Government lands. b) Maintenance of all federally owned Government Building and their furnishing except those financed from Defence budget. c) Construction of federally financed Government Offices and residential accommodation. d) Management of Federal Lodges. e) To act as technical adviser to Federal Government in Engineering matters.

JST asked following questions:

- Does Pak PWD have the power for authorization against entire building sector?

Reply: No because the Pak PWD as per Rules of Business, 1973 is responsible of all federal government buildings. Presently it is maintaining the 131 offices buildings and 16,000 residential buildings/houses/apartments etc.

- Number of buildings being maintained by Pak PWD subject to equipment, maintenance period, maintenance company name.

Reply: Chief Engineer informed that they have been maintaining the 131 Office Buildings and 16,000 residential houses/buildings/apartments etc. As regards, period of maintenance of buildings, he informed that after construction of building for one year the contractors are responsible to carry out maintenance. After one year relevant departments carry out maintenance of the buildings. If buildings are handed over to Pak PWD, then it carries out maintenance of the buildings forever.

There are following categories of maintenance of buildings:

- i. Usual Maintenance:** PWD carries out day to day maintenance of the buildings.
- ii. Special Repair S/R:** If anything is completely out of order in the building, repairing of that place is carried out.
- iii. A-1 Minor:** When new construction is required in the existing buildings, such maintenance is carried out.

2) Organization Chart:

JST confirmed the organization chart of PWD. Chief Engineer provided the copy of latest organization chart.

3) Act and by-law

As mentioned, Rules of Business, 1973 exists as related laws.

Chief Engineer informed that Pakistan Public Works Department is a Federal Department operating under the Ministry of Housing and Works (attached department) with its Headquarters located in Islamabad and sub-offices in all the major cities of the country. PWD is in operation since pre-independence day. This organization is the oldest organization in Pakistan.

Chief Engineer showed the Pak PWD code 1982 (revised) and stated that they follow the procedures of designing/constructions the buildings whatever laid down in this code.

4) Confirmation and explanation of the number of office and staff.

Chief Engineer informed that number of Staff prepared by JST cannot be confirmed because number of staff is changing time.

Ban on Housing Unit in Pakistan

Chief Engineer informed that in the year 1993-94, a ban was imposed on construction of housing unit for federal government employees and was decided to give them monthly house rent. Since then, no construction of houses is being carried out by Pak PWD. Government has established different authorities/departments for housing units e.g. Pakistan Housing Authority (PHA) and Federal Government Employees Housing Foundation (FGEHF). Further after the year 1994, approval of PC-I against residential accommodation was banned by the Government.

Building Code of Pakistan

Chief Engineer informed that they have been following Pakistan Building Code 2007. After the disasterous earthquake in Pakistan in the year 2005, these codes were adopted. Before these codes, they were following

the Pakistan Building Codes, 1995. Presently they have been maintain the following number of buildings:

- In Islamabad: 5,300 buildings/houses
- In Karachi: 8,400 buildings/houses
- In Peshawar, Lahore, Quetta: 2,300 buildings/houses

For maintenance of the buildings/houses, they have various inquiry offices in the major cities in order to provide maintenance services. They have 5,700 staff for maintenance of buildings. All staff is being paid by Pak PWD.

Situation for compliance with building code of Pakistan (energy provision 2011)

Chief Engineer informed that he personally knows the building code of Pakistan (energy provision-2011) but his department does not know because this document has not yet been circulated to Pak PWD. Once he used to attend the meetings of BCP-EP-2011 in Pakistan Engineering Council while opinion for formulation of such code was initiated. Later on, he expressed serious observations and in the subsequent meetings of PEC, he was not invited. HE further stated, when BCP-EP-2011 was finally prepared, he was not also invited to give Pak PWD's suggestions.

He appreciated such code and stated that it should be followed in true letter and spirit but such document has not yet been circulated to Pak PWD.

He further stated that it is very much difficult to apply BCP-EP-2011 in the existing buildings, but it will be very much useful for future buildings. It will really converse a lot of energy if it is implemented. Particularly, all architects should clearly be directed to enforce these codes, if the Government of Pakistan wants.

MEETING MEMO

Date	18 th August, 2015	Time	02:00 p.m to 03:00 p.m
Organization	Islamabad Electric Supply Company (IESCO) Venue: IESCO Head Office, G-7/4, Islamabad		
Department			
Attendances	IESCO: i. Engr. Sheikh Abid Iqbal, Chief Engineer P&E ii. Engr. Khalid Nazir, General Manager (CS) iii. Engr. Wasif Hussain Khan, General Manager (Operation) JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. Application form for new electricity connection. ii. Latest electricity tariffs of IESCO. iii. Consumer wise percentage of electricity consumption list. iv. Tariff wise number of consumer of IESCO. v. Abridged conditions of electricity supply.		
Discussed			
<u>Introduction and presentation of inception report.</u>			
<p>At the inception, JST thanked the IESCO for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.</p>			
<u>Procedure of application of electricity contract</u>			
<p>JST requested to know Procedure of application of electricity contract. IESCO informed that there are following categories of contract by sector.</p>			
<ul style="list-style-type: none"> i. Domestic Connections ii. Commercial connections. iii. Industrial connections 			
<p>These connections are based on electric load of single phase upto 5 KW (PKR.4000/-) and three phase upto 15 KW (PKR8500/-).</p>			
<p>1) Domestic connections:</p>			
<p>Any applicant intending to get electricity connection may apply on the prescribed form for electricity connection along with following documents:</p>			
<ul style="list-style-type: none"> i. Ownership proof ii. Copies of CNIC 			
<p>Besides above stated documents, the applicant has to sign the abridged conditions of supply form as per requirement of Electricity Act, 1910. Thereafter IESCO staff visits the site and prepares estimate of material expected to be used (only 40 meter cable is provided by IESCO, if it exceeds, the consumer has to pay) and only then issues demand note to the applicant requesting him to deposit the amount within the stipulated time. Deposit includes all estimated capital cost with security of one month electricity usage. Finally, there is separate authority i.e. Electrical Inspector in each province under the control of Ministry of Electricity Department who gives certificate of fit and appropriate wiring (Test Report). After his certificate IESCO again verifies that whatever has been mentioned in the application is correct or not only then installs the</p>			

electricity meter.

2) Commercial and high rise buildings:

IESCO informed that as per prevailing SoP, the application for provision of electricity/extension in load in respect of buildings having covered area more than 20,000 sq. ft, or having applied load more than 500 KW are required to be submitted in the Office of Chief Engineer (P&E) IESCO with the following pre-requisites, which are mandatory for processing of such like cases.

- i. NOC and approved layout plan of the subject premises by the concerned administrative authority.
- ii. Proper design for external electrification duly prepared by the registered consultant of Pakistan Engineering Council (PEC) which must include BOQ/cost estimate, assessment of load on the basis of total covered area as per WAPDA/IESCO criteria, external electrical system marked on layout plan & feeding source with single line diagram and load flow analysis.
- iii. The registered consultant must have the latest renewal of his registration i.e. for the current year and have been registered with PEC for electrical works.

Besides above, the following documents are also required to be submitted alongwith the case.

- i. Application form duly signed by the applicant.
- ii. Attested copy of CNIC (applicant + witness)
- iii. Abridged conditions of supply form signed by the applicant.
- iv. Copy of applicable tariff duly signed by the applicant.
- v. Undertaking on stamp paper specimen attached (latest by the oath commissioner)
- vi. Ownership of the building.

3) Industrial connections:

IESCO informed that as per prevailing SoP, following are pre-requisites for industrial connections:

- i. Ownership proof from the applicant
- ii. 'No objection certificate' from the land lord (if the applicant is tenant) alongwith land lord ownership proof.
- iii. Undertaking on stamp paper of Rs.50 as per specimen attached.
- iv. The power of attorney (in case of limited company), in favour of the applicant to the effect that the applicant is authorized to sign the application and execute agreement.
- v. In case of limited company, the list of Managers, Directors etc, complete addresses and attested photocopies of all documents regarding registration of the limited company.
- vi. In case of extension of load, the arrear nil certificate from the concerned Customer Services Office of IESCO is also required to be attached with the case.
- vii. If the connection is applied in the name of company, duly incorporated under the law, then following additional documents shall be attached.
 - a. Certificate of incorporation
 - b. Resolution of board of director authorizing a person to sign and execute the application and agreement form.

- c. Charge creation certificate issued by the securities and exchange commission of Pakistan equivalent to the amount of security.
- d. List of directors with complete addresses and copies of their computerized national identity cards.

Besides the above, following documents are also required to be submitted alongwith the case.

- i. Application form
- ii. Attested copy of NIC (applicant + witness)
- iii. Abridged conditions of supply form.
- iv. Copy of applicable tariff.
- v. Affidavit on non-judicial Rs.50/- specimen attached.

4) Upgradation of load capacity of contract

IESCO informed that if anyone wants to upgrade his buildings/house load, again on the same form he has to apply for extension of load. IESCO staff will visit the site and prepare new estimate (if there is need to install new transfer of any other L.T line, the applicant has to bear all expenditure), then issues demand note requesting applicant to kindly deposit the prescribed amount along with security in advance.

JST requested that if government of Pakistan requests the IESCO for not provision of electricity to the public until and unless a certificate is provided by client, what IESCO will do? Chief Engineer informed that they will surely comply with the directions of NEPRA.

Number of contract by sector

JST requested to know the number of contract by sector. IESCO informed that they would share such data as soon as possible.

Peak time and peak Demand.

IESCO informed that following are to seasons in which peak time is observed:

- i. Summer season: peak time is from 05:00 p.m. to 11:00 p.m. (In summer season, people use air conditioners, therefore, consumption of electricity goes high from 05:00 p.m. to till 03:00 a.m. when people switch off their A.Cs).
- ii. Winter season: peak time is from 05:00 p.m. to 09:00 p.m. (In winter season, major factor of light increases consumption of electricity).

It was further informed that in summer season lifeline consumer (tariff slab of 01-100kwh) decreases because of the usage of fan.. Similarly in winter number of lifeline consumer increases because no heating is required in most of the area in Pakistan. The lifeline consumer only uses one or two bulb and one fan and for kitchen they use natural gas or wood.

Energy consumption on typical building and dwelling

IESCO informed that they do not have data of electricity consumption in building sector wise, they have only tariff wise data. Further it was informed that only two months in the year there is no load shedding, other months they observe load shedding. Load shedding schedule is as follows:

- i. Summer season: 6 hours in urban area and 8 hours in rural areas.

ii. Winter season: 4 hours in urban area and 6 hours in rural areas.

Idea to improve energy efficiency in the building sector.

IESCO informed presently trend is to more towards housing societies and high rise buildings (offices/commercial/residential).

- People should go for single story buildings because Pakistan have sufficient land.
- For elimination of load shedding, Pakistan should generate more electricity and cheaper electricity. Due to cheaper energy, people would be able to maintain their living standards.
- Pakistan should control population.
- Hyderal generation is important because it may also reduce the price of energy
- Buildings must be energy efficient.
- Again electricity generation is very big issue, until and unless more generation is not done, load shedding is not possible to eliminate.

MEETING MEMO

Date	18 th August, 2015	Time	02:30 p.m to 03:30 p.m
Organization	Federal Board of Revenue (FBR), Islamabad Venue: FBR House, Constitution Avenue, G-5/2 Islamabad		
Department			
Attendances	FBR: <ul style="list-style-type: none"> i. Mr. Nadeem Dar, Member (Facilitation and Tax Education) ii. Mr. Abdul Hameed Memon, Chief (Sale Tax) iii. Ms. Tehmina Aamir, Chief (Facilitation and Tax Education) iv. Mr. Tariq Sher, Secretary (Sales Tax) JST: Mr. Hirooka Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the FBR for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.</p> <p><u>Taxation system regarding building sector in Pakistan</u></p> <p>JST requested to know the taxation system in the building sector of Pakistan. Member FBR informed that at present they are working with the IMF Structural Adjustment Loan. Under this loan, FBR is not allowed to exempt anybody from tax. For any other kind of tax exemption, case must go to Parliament for its approval.</p> <p><u>Property Tax:</u> FBR stated that they do not deal with the property tax. Property tax directly comes under the control of Provincial Governments like in case of Punjab, it is a Punjab Revenue Authority which levies tax on property.</p> <p><u>FBR Tax:</u> FBR deals with the income tax and tax on goods.</p> <p>FBR further informed previously there was a joint study by FBR and George University USA financed by World Bank in order to know the property tax. If that study is found, he will share with JST.</p> <p><u>Tax Rates:</u> FBR informed that every province has its own tax rates and areas. Property in Province is divided into following categories:</p> <ul style="list-style-type: none"> i. Agricultural property (Agriculture property is not taxed in Pakistan) ii. City Property: City property is taxed. It has further two kinds: <ul style="list-style-type: none"> a) Residential property. b) Commercial property. <p>Above said property is also divided into zones. Every zone has its own and different rates of tax. For example if property is self-occupied, there will be less tax on it. If Property is rented out to tenant, it will be high tax. Rates are multiplied by covered area for property tax calculation. Income coming property is taxed by FBR. For example, if a person has property and he has rented it out to other person as tenant, whatever he earns from this building, it will be taxed by FBR. In calculating the income, FBR allows some expenses like maintenance of the house/building, repairing of the building then FBR gets net amount.</p>		

Covered Area: FBR Member informed that definition of covered area is that anything which has roof is called covered area. If there is a double story building, the covered area will also be doubled.

Tax registration.

When new building is constructed, building owner has to register their property to respective revenue authority. Revenue authority also carry out their survey of property tax every three years.

Tax in Islamabad capital.

FBR informed that recently Government of Punjab in the Budget 2015-2016 has imposed tax on builders.

Each province has its own tariff rate which can be got from Provincial Governments in Punjab and Sindh.

Further stated that FBR imposes tax on goods and services in Islamabad and also imposes tax on buildings material only bricks and crushed stones are exempted from tax because low income people usually use bricks.

Further stated that it is government policy to support building sector in Pakistan. Therefore, Government of Pakistan has exempted the renewable energy solar panel from custom duty and services tax. Detailed schedule will be sent by email by Member.

Provincial Tax

FBR informed that the Provincial Government imposes tax on services in the provinces and it is called sales tax in province. Following are the rates of tax in provinces:

- i. Punjab 16%
- ii. Sindh 15%
- iii. Balochistan 17%
- iv. Islamabad 17%

Procedures of exemption

FBR informed that procedure for exemption on tax was very much easier before announcement of Budget 2015-2016. Now after 1st July, 2015 this procedure has become difficult. If any exemption on tax is required to be done, any government department like Ministry of Water and Power can initiate such proposal while preparing and sending summary to the Economic Coordination Committee (ECC), then this Committee can consider whether exemption has to be granted or not.

Tax incentives:

FBR informed that as presently they are working under IMF Structural Adjustment Loan, therefore, they cannot exempt tax. However, tax credit can be given to those who completely pays tax for example. He further stated for initiating such proposals/exemptions, best time is the April, 2016

because in these days government usually prepares budget.

Provision of documents

FBR stated that they can provide following documents:

- i. Tax contribution of constructor sectors in Pakistan (both in rupees and percentage)
- ii. Income coming from property (both in rupees and percentage)

Suggestion for meeting Provincial Tax Authority

FBR suggested that in order to get all information relating to property tax, it is necessary to have meeting with Provincial Governments, they can provide such information to JST.

Advance Income Tax

FBR informed there is advance income tax on sale and purchase of property. This tax paid by buyers and sellers can be adjusted annually if the buyers and sellers pay tax. Rate of this tax will be sent by email.

Penalty

FBR informed that default to any tax, there is penalty under the law to be imposed on the defaulters.

Tax collection:

FBR informed that tax collected by FBR directly goes to Ministry of Finance and is deposited either in National Bank of Pakistan, or State Bank of Pakistan or in Government Treasury under heads of Government. First of all, Ministry of Finance distributes this amount among the provinces and remaining amount is allocated for the Ministries/Divisions/Departments in the annual Budget. There is a NFC award. If any Provincial Government wants more money, they can go to NFC for allocation of more money while giving plausible reasons.

Provincial Government's source of tax

FBR informed that in Punjab there are following two sources from which, Government collects taxes in the province.

- i. Own Source: Government of Punjab levies tax on sale, motors vehicle tax, agricultural tax, water use tax, professional tax, property tax etc.
- ii. Second Source: Government of Punjab gets money from Federal Government by requested to NFC

Data of tax regarding buildings and house:

FBR informed that data regarding tax on buildings and houses in Punjab can be got from Punjab Revenue Authority, Lahore. Both provincial governments i.e. Punjab and Sindh do have computerized data available with them. JST will try to contact them for further data such as number of property, covered area, etc.

MEETING MEMO

Date	20 th August, 2015	Time	11:00 a.m to 12:00 noon.
Organization	GIZ Islamabad Venue: GIZ House No.11-B, Street No.50 F-8/4, Islamabad.		
Department			
Attendances	GIZ: <ol style="list-style-type: none"> i. Dr. Frank Fecher, Principal Advisor. ii. Mr. Mohammad Irshad Khan, Chief Technical Advisor. iii. Ms. Amber Pervaiz, Technical Advisor. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the GIZ for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project. JST informed that as Pakistan Engineering Council with collaboration of Task Force Committee has prepared Building Code of Pakistan (Energy Provision-2011), JST is looking for promotion and implementation of this code. JST further informed that it has been studying the current situation of energy efficiency and conservation in the building sectors of Pakistan and at the end of this study we may propose some ideas for further projects.</p> <p><u>Activities of GIZ in Pakistan.</u></p> <p>GIZ informed that it has been active in Pakistan with its Renewable Energy an Energy Efficiency (RE-EE) programme since 2005, working on behalf of the German Federal Ministry for Economic Cooperation and Development. The existing phase of the RE-EE programme is from September, 2011 to August, 2014. The programme, together with its partners aims to:</p> <ul style="list-style-type: none"> ▪ Support the federal and provincial government department on issues pertaining to energy policies an development of market based instruments for investment in renewable energy (RE) and energy efficiency (EE) applications. Gender and climate change mitigation aspects are considered within. ▪ Provide technical assistance and support in the development of institutional and technical capacities of partner institutions at federal and provincial levels. ▪ Provide technical assistance and support to public and private sector partners for development and increase of RE applications, namely solar (photovoltaic (PV) and thermal), mini and micro hydropower (MHP) and biomass/biogas. ▪ Promote the productive use of renewable energy (PURE), as a downstream activity of MHP development assistance, ensuring equal opportunities for both men and women. ▪ Introduce and promote Energy management Systems (EnMS) in four industrial sectors, namely textile, steel re-rolling, edible oil and steel foundries. ▪ Provide technical assistance in the development of energy service companies (ESCOs) for offering 		

reliable consulting services on EnMS application on commercial basis to different industrial sectors.

Green Building scheme and another incentive

GIZ informed that presently they are focusing on renewable energy & energy efficiency with Punjab Energy Efficiency and Conservation Department and developing with them concept of Green Building.

GIZ discussed that IFC is also working and wants to support the labeling system on Fans and boilers in Punjab. ENRECON with collaboration of BRESL Project has already done working on it.

Projects of GIZ

GIZ informed that it has been working to construct WAPDA building in Lahore as pilot project, but now they are at planning stage which may take 2 more years. Similarly, a pilot project is also being carried out by KFW (German Bank) in the Sakrdu City.

GIZ is also doing capacity building of Architects, Engineers while involving Academia and other stakeholders in Punjab. Further informed once the guidelines are formalized it would be on voluntary basis people may adopt on voluntary basis then after some time it will automatically become mandatory regulations when most of people started adopting it.

GIZ further informed that Punjab Government is very keen for promotion of energy efficiency and conservation. For that purpose, it has put some efforts and is looking for finance to support EE&C. GIZ further said that its counterpart organization is Punjab Energy Efficiency and Conservation Agency (PEECA) in Lahore which is struggling for EE&C. Another organization IFC is also supporting PEECA.

GIZ is also going to hold workshop on 16th September in order to educate the stakeholders about energy efficiency and conservation in Pakistan.

Interest of GIZ for joint activities with JICA

GIZ very eloquently informed that they will be more than happy, if JICA agrees to carry out energy efficiency and conservation project together because they are also doing the same. A copy of Building Code of Pakistan (Energy Provision-2011) was shared with GIZ. GIZ informed they would consult such code with their consultant team.

Green Bank Scheme.

GIZ informed that it is only one bank namely Al-Falah Bank which first time started financing upto 5 million rupees for only top roof construction of buildings. This loan is being provided for solar PV system but there is no reduced interest rate which is major barrier.

Counterpart.

GIZ informed that Government of Pakistan allocated budget for ENERCON which is called Energy Conservation Fund, but things did not happened. GIZ now almost shifting its counterpart from ENERCON to PEECA.

Suggestions/Ideas of GIZ

GIZ informed that they are looking for industrial side to promote renewable energy and energy efficiency and they are open to the idea to carry out such work together with JICA. GIZ said there is another activity going on with State Bank of Pakistan under Housing Green Banking Units. In this scheme, GIZ works to

encourage private persons to build their own new homes (incentive scheme), but GIZ did never participate in the meetings.

GIZ further informed that German Ministry of Economic and Cooperation has decided to launch energy as focal area starting from year 2016-2021 and it is their expectation that German Ministry will give GIZ some finance.

GIZ also suggested that awareness campaign is the utmost for general public. Pakistan Architect Council should also educate the Architects for energy efficiency and conservation. GIZ invited attention on existing buildings in Pakistan and stated that insulation of existing buildings is of very poor quality and people are not following to adopt energy efficiency measures.

MEETING MEMO

Date	24 th August , 2015	Time	11:00 a.m to 1:00 p.m
Organization	Housing Urban Development and Public Health Engineering of Punjab, Lahore. Venue: 2-Lake Road, Lahore		
Department			
Attendances	HUD & PHED: i. Eng. Muazzam Jamil Malik, Deputy Secretary (UD). ii. Mr. Mumtaz, Deputy Secretary (Housing). ENERCON: Mr. Asad Mehmood, Manager Technical ECF. MoST: Mr. Ashfaq, Deputy Technical Advisor. LDA: Syed Muhammad Nadeem Akhtar, Director (TP) PEC: Engr. Sadaqat Ali Khan, Dy. Registrar, Lahore Office. FDA: Majid Hussain, Town Planner GDA: Mr. Umar Farooq, Deputy Director (TP) JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Answers to questionnaire from GDA		
Discussed	<p><u>Introduction and preliminary discussion.</u></p> <p>Mr. Muazzam, Deputy Secretary welcomed the JST at HUD&PHED. JST thanked and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background that GOP imposed the Building Code of Pakistan (Energy Provision-2011) hereinafter referred to BCP-EP-2011 against the building sector on a mandatory basis and has implemented the same since 2013. As no detailed rules and penalties were defined in the energy provision, such relevant institutions and framework must be provided as soon as possible. In addition to non-residential buildings subject to the current provision, GOP is attempting to cover residential buildings subject to the energy provision and set its criteria.</p> <p>JST further stated that JICA has keen interest in improvement of EE&C in the building sector of Pakistan and JICA dispatches its team called JICA Study Team to clarify current situation of energy efficiency in the building sector of Pakistan and then make necessary countermeasures against existing barriers for implementation of BCP-DP-2011. Objective of the survey was also explained in length.</p> <p><u>Recognition of BCP-EP-2011</u></p> <p>1) View point from Ministry of Science and Technology (MoST):</p> <p>Mr. Ashfaq Ahmed, Deputy Technical Advisor invited the attention of the participant on Building Code of Pakistan (Energy Provision-2011) and stated that these codes have accordingly been prepared by Pakistan Engineering Council under recommendations of Task Force Committee formulated for preparation of Building Code and duly notified by the Ministry of Science and Technology for its implementation by the relevant stakeholders.</p> <p>2) View point from ENERCON</p> <p>Mr. Asad Mehmood, informed that ENERCON is going to organize meeting of Task Force on 10th or 11^h</p>		

September, 2015 for sharing ideas of experts. Engr. Muazzam proposed and suggested to invite the following organizations in the upcoming Task Force Committee as well:

- i. All Development Authorities under HUD&PHED, Government of Punjab, Lahore.
- ii. All TMAs under Local Government & Community Development, Government of Punjab, Lahore
- iii. Urban Unit Company's CEO Dr. Nasir. This company is run by Government of Punjab.
- iv. PHATA
- v. DHA, Islamabad, Lahore and Karachi.
- vi. Bahria Town, Islamabad.

Town Planner, FDA informed that Development Authorities are working on particular areas in the respective major cities of Punjab rest of the areas directly come under the jurisdiction of TMAs all over the Punjab. Therefore, presence of TMAs is very much essential for implementation of BCP-EP-2011. On question of JST, it was informed by Dy. Director GDA that almost 144 TMAs under Local Government and Community Development are working in the Punjab.

3) View point from PEC

Deputy Registrar, Lahore Office informed that it is clearly mentioned in the BCP-EP-2011 (page No.-15) that it has become mandatory for consulting firms to obey these codes and procedures, if any consulting/engineering firm does not obey these procedures/codes, it shall be considered violation as BCP-EP-2011.

He further stated it is best Engineering Firm and Development Authorities in Punjab who can implement BCP-EP-2011 in true letter and spirit. Similarly, if client (Development Authority) complaints about any consulting engineer/designer, PEC fixes inquiry against those and they gives punishment under Professional Misconduct Code to the delinquents.

Upon clarification by JST, PEC stated that even though BCP-EP-2011 are not adopted by DA/TMA for their approval process at the moment, Consultant/ Contractors are remain responsible for compliance of BCP-EP-2011.

4) HUD&PHED stance

Engr. Muazzam informed that all development authorities in Punjab are autonomous in nature and have their own respective Board of Directors. All development authorities are empowered to adopt any regulations or to make necessary amendments in the existing regulations as per their local needs. If any D.A has to adopt BCP-EP-2011, it must have to go to respective Board of Directors, then can only implement BCP-EP-2011.

5) View point from Gujranwala Development Authority (GDA)

Mr. Umar Farooq, Deputy Director (TP) stated that no development authority in Punjab is following Pakistan Building Code (Energy Provision-2011) except LDA because LDA recently amended ins

regulations and incorporated few provisions of energy like LED lights in the building. He further said like other development authorities in Punjab, GDA has been following the Model Building and Zoning Regulations, 2007

6) View point of Faisarabad Development Authority (FDA)

Mr. Majid Hussain, informed that no D.A follows Pakistan Building Code (Energy Provision-2011) except LDA because LDA has recently changed its regulations and added some provisions to conserve energy in the building. He said after this meeting he is going to recommend BCP-EP-2011 to their Board of Directors for adoption. Presently FDA is following Model Building and Zoning Regulations, 2007

Support for adoption of BCP-EP-2011.

JST intended to know what kind of support is required to adopt BCP-EP-2011 by Board of Directors. Engr. Muazzam informed that BCP-EP- 2011 is comprehensive enough to explain and convince the respective Board of Directors in Punjab for adoption of BCP-EP-2011.

Curriculum of energy efficiency and conservation

PEC informed that they have already requested as well as suggested every relevant institution to adopt Building Code of Pakistan (Energy Provision-2011) in their curriculum. He further stated that curriculum is reviewed after three years on the recommendations of Curriculum Committee of Higher Education Commission (HEC). To see wide range of curriculums in Pakistani Universities, JST can see official website of HEC i.e. www.hec.gov.pk

PEC also stated that there are 4 courses programmed in CPD regarding building energy efficiency. Information is available in PEC web site.

Issues on existing rules, regulations and implementation.

JST intended to know the human resource for implementation of BCP-EP-2011. FDA informed that every Development Authority has its own Building Control Directorate under which following officers work:

- i. Director BCD
- ii. Deputy Directors.
- iii. Assistant Directors
- iv. Building Inspectors and
- v. Other supporting staff

Similarly, every development authority has various distinctive wings/sections dealing with each matter separately like Engineering Directorate, Building Control Directorate etc. He further stated all D.As have mechanism/system to adjust organization as necessary for implementation of BCP-EP-2011, if it is adopted

with the approval of relevant Board of Directors.

Implementation methodology of Building Code

1) Procedure of submission of plan to DAs

On request of JST, it was informed that clients submit detailed building plans/structural drawings. Submitted drawings are referred to respective inspectors for vetting. Inspector check drawings and issue certificate. LDA informed that LDA issues conditional (35 conditions) letter. They give inspection/ approval in following phases.

- i. Drawing review and approval
- ii. Basement (plinth level): Inspector or Assistant Director visits/inspects the site.
- iii. Structural Engineer also visits/inspects then LDA allows constructing upto 38 feet.
- iv. Upper plan approval.
- v. After finalization of construction, again inspection is carried out.
- vi. Issuance of completion certificate.

2) Structural Design Review(BCP-SP-2007)

Upon clarification by JST, LDA stated current review process & human resources as below.

Drawings to submit: Structural drawings and calculation.

Human resources: LDA has 3 structural engineers to review drawing and inspection.

Site inspection: Structural engineer attends site inspection in respective stage together with inspector.

3) Number of inspectors and application

LDA/FDA Director informed that at present he does not have such information. He assured to send such information by email or fax as soon as possible. GDA director submitted answers to questionnaire as following.

GDA information:

Inspector: 5 inspector (2 inspector, 2 sub-engineer, 1 admin officer)

Qualification of inspector: Three years Diploma in civil engineering

Number of application: 15-20 application annually.

Number of inspection: once a week

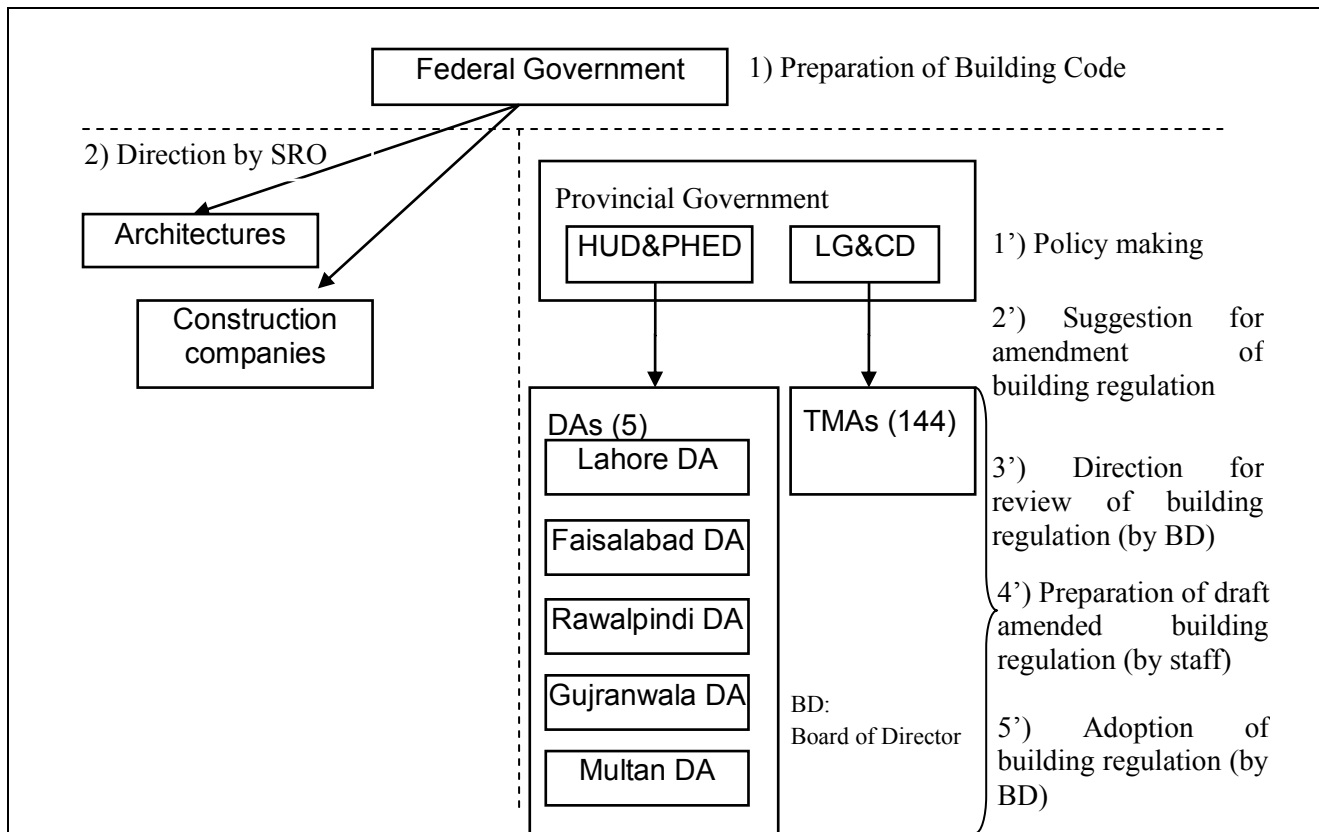
Number of building 1000m² or more: No building more than 100m² because Model Town is controlled area of GDA.

Clarification of responsibility demarcation

Clarification of responsibility demarcation was discussed in length. Chart was also got clarified from the participants of the meeting.

	Tasks	Player										
		ENERCON	PEC	PSQCA	HUD & PHED	LG & CD	DA	TMA	Academic field	Designers	Constructors	Manufacturers
Federal	Suggestion to amend BCP-EP-2011	X	-	-	-	-	-	-	-	-	-	-
	Policy making for amendment of BCP-EP-2011	X	-	-	-	-	-	-	-	-	-	-
	Preparation (aegis) of amendment	-	X	-	-	-	-	-	-	-	-	-
	Formulation of Task Force	x	X	x	-	-	x	-	x	x	x	x
	Approval as Pakistan Standard	-	-	X	-	-	-	-	-	-	-	-
	Approval of amendment	X*1	-	-	-	-	-	-	-	-	-	-
	Issuance of amendment	-	X*2	-	-	-	-	-	-	-	-	-
Province & Local Gov.	Policy making for adoption of BCP-EP-2011	-	-	-	X	X	-	-	-	-	-	-
	Preparation of draft amended building regulation	-	-	-	-	-	X	X	-	-	-	-
	Direction for review of building regulation	-	-	-	-	-	X	X	-	-	-	-
	Adoption of building regulation	-	-	-	-	-	X	X	-	-	-	-

X: main player (chair person), x: participant



Source: Prepared by JICA Survey Team with assumption based on interview from relevant organization

Unification of all D.As into one Development authority in entire Punjab.

HuD&PHED informed that previously there was a proposal in the Government of Punjab to unify all development authorities into one authority in the entire Punjab but that proposal has not got any maturity because it requires legislation.

Application of Building Code of Pakistan (Energy Provision-2011): Deputy Registrar, PEC Lahore Office informed and discussed the following provisions of BCP-EP-1011 and its applicability:

(1) The provisions of building code of Pakistan (energy provisions-2011) shall apply for engineering design of buildings and building clusters that have a total connected load of 100 Kilo Watts or greater, or a contract demand of 125 KVA or greater, or a conditioned area of 900 m² or greater, or un-conditioned buildings of covered of 1,200 m² or more.

(2) The scope of the energy provision is applicable to the following to provide minimum energy efficient requirements for the design and construction of:-

- a) new building and their systems;
- b) new portions of existing buildings and their systems, if the conditioned area or connected load exceeds the limit prescribed under sub-by-law;
- c) new systems and new equipments in existing buildings; and

d) increase in the electricity load beyond the limit mentioned in sub-by-law

Applicability of Buildings Code and Applicable building systems:

PEC informed that the energy provisions shall apply to the following:-

- i. Building envelopes
- ii. Building mechanical systems and equipment, including heating, ventilation, and air conditioning (HVAC).
- iii. Service water heating
- iv. Lighting and
- v. Electrical power and motors.

There are certain **EXEMPTIONS** of energy provisions on the buildings. Following energy provisions shall not apply to the buildings:-

- i. Buildings that do not use either electricity or fossil fuel.
- ii. Government notified historically significant and heritage buildings.

Equipment and portions of building systems that use energy only for manufacturing processes.

Local government offices TMAs

Except the above stated authorities/organization, there are local government offices called Town Municipal Administration (TMA) in the entire Punjab. Almost 144 TMAs are working in addition to five Development Authorities in Punjab. These TMAs are operating directly under the control of Local Government and Community Development, Government of Punjab, Lahore.

Barriers/issues for implementation of current BCP.

It was informed that following are the barriers which can be impediment for implementation of current BCP-EP-2011 in true letter and spirit.

- i. Capacity building of existing staff.
- ii. Hiring of new trained staff/human resource.
- iii. Machinery for safe demolition of buildings.
- iv. Technical Trainings of the staff for understanding the energy provisions exactly.

MEETING MEMO

Date	25 th August, 2015	Time	4:00 p.m to 6:00 p.m
Organization	Diamond Jumblon Venue: 180-G, Johar Town Lahore.		
Department			
Attendances	Diamond Jumblon: i. Mr. Tariq Farooq, Executive Director ii. Mr. Nisar Mohyuddin, General Manager JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. Obtained C.D containing presentation of Diamond Jumblon ii. Brochures containing information of insulation		

Discussed

Introduction

At the inception, JST thanked the Diamond Jumblon for arrangement of the meeting and presented the activities, objectives and backgrounds of the data collection survey on energy efficiency and conservation in the building sector of Pakistan.

Presentation of BCP-EP-2011

Mr. Nisar, General Manager explained the role and functions of Diamond Jumblon and stated that when BCP-EP-2011 was framed in the year 2011, there were so many members of Task Force Committee which recommended these with energy provision. Important members were IAP, Pepco, engineering universities, ASHRAE, CDA but none of them has encouraged the development authorities and relevant stakeholders to follow this law. He further stated that they had been continuously kept in touch with PEC

They requested PEC for implementation of this document in true letter and spirit but PEC has persistently been saying that they do not have trained staff, engineers etc, therefore, they do not instruct the constructors to implement this document. Similarly due to lack of trained staff in CDA, they do not implement this document.

Further stated that as per instructions given the BCP-EP-2011, building code energy provision is required to be revised in one year after implementation, but despite lapse of two years since 2013 nothing has yet been done on its review.

Responsibility of Government of Pakistan

General Manager informed that Government of Pakistan has neither yet instructed the relevant authorities nor circulated it for the information and implementation, therefore, nobody is following BCP-EP-2011. He said they are educating the people by themselves. Non-awareness is considered to be major impediment for implementation of this code.

Cost of insulation for the buildings

General Manager informed that cost of insulation is very low approximately 1% of the total construction cost

of residential or commercial buildings. Further stated every small house owner in Pakistan is keen to have at least one air conditioner. Whoever has the house of 2200 S.q.ft in Pakistan is belonging to middle class and they have A.Cs in their homes but these A.Cs are creating load on our electricity.

Cost of insulation which they are producing is Rs.94 per sq. ft , adding second layer of bricks(Rs.50-60/ sqft) for those, total additional cost will be Rs 184 in new construction. There is another technique to plaster directly on the insulation without brick work, which costs Rs.120/- per sq.ft. He said as the life of buildings in Pakistan is approximately 50-70 years, therefore, insulation in residential/commercial is economical because it reduces the electricity load for such long period.

Two standards of insulation EPS and XPS.

Further stated that they have been producing both standards insulation e.g EPS and XPS. He stated that EPS insulation requires 4 inches while XPS insulation requires 2 inches to satisfy same performance of heat transmission. Strength of XPS is long life time due to its water proofing nature. EPS tends to loose its performance if water goes inside. Price of the XPS is doubled than EPS in same thickness. Recent trend is that architect and contractor prefers to choose XPS.

Use of insulation in residential and commercial buildings

Executive Director informed that residential building in a city area of the Lahore with involvement of registered architect, the percentage of insulation usage to the roof will be 10% approximately. Out of the insulated residential building above, 10% of project may have insulation to both roof and wall. (1% in total) In case of Commercial buildings and similarly buildings are designed by Architect and in City area including Government Buildings, Hospitals, Universities etc, percentage of only roof insulation user will be less than 5%. (0.5% for roof and wall)

Factory walk through

Diamond Jambolon, established 10 years ago, is the only manufacturer of XPS in Pakistan. Approx 60 ton/month of sales.(24,000 3"x6" panel in 50mm thick)

MEETING MEMO

Date	25 th August, 2015	Time	11:00 a.m to 1:00 p.m
Organization	Lahore Electric Supply Company (LESCO) Venue: LESCO Head Office, Lahore		
Department			
Attendances	LESCO: <ul style="list-style-type: none"> i. Ch. Akhtar Chief Engineer (Development) ii. Mr. Tariq-Commercial iii. Mr. Faisal Zakria-Planning JST: Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	i. Electricity Demand Curve.		
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the LESCO for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the project.</p> <p><u>Procedure of application of electricity contract</u></p> <p>Chief Engineer at the outset informed that initially they assess the buildings request for electricity connection per square ft as whole building then provide individual energy connection to everyone on the basis of total area of the building subject to applications of office holders existing in the building.</p> <p>Further stated there is a design book. Everybody has to follow it. Following is the procedure of submitting application to LESCO:</p> <p>‘Housing Societies are required to submit their electrical design prepared by consultant and approved by the respective Civic Agency like LDA as per SoP which indicates the total demand of electricity, and lighting, power etc. LESCO then reviews the electrical design and inspects the site physically in order to calculate/assess transformer cost, LT line cost, Conductors cost etc. An individual study of covered area, use of buildings, location of the building is carried out prior to start construction at the site.</p> <p><u>Stealing electricity, contract with false electric capacity</u></p> <p>Chief Engineer informed that people are not only stealing electricity but also using it without paying to LESCO. Further stated that reported theft cases in the year 2014-2015 are approximately 1% of the total electricity sold which is about 1.5 mil units. This figure also includes the defective meters, slow meters, stealing energy. In numbers there are 90,000 consumers who are using electricity as a theft.</p> <p><u>Penalty for late payment</u></p> <p>LESCO stated that they have a regulation to penalize late payment customer. If payment delays, LESCO is entitled to charge with interest.</p> <p><u>Upgradation of load capacity of contract</u></p> <p>Chief Engineer stated that if any consumer is going to increase electricity load, he/she has to apply prior to increase but people in Pakistan keeping using more load and also paying utility bills accordingly. Particularly</p>		

in domestic electricity connections, some time, people increase their load but LESCO does not bother to ask them if they are paying utility bills to LESCO.

Similarly there is a division of load:

- i. Single phase upto 5 kVA
- ii. Three phase upto 15 kVA

Billing system is entirely automatic and meters measure consumption of electricity according to meter programme. Electricity meters record peak time and off peak time as follows:

- i. Meter records 6 hours peak time
- ii. Meter records 18 hours off peak time.

These meters have capacity to maintain record of consumption which is built in programming in the meter.

Further stated LESCO has started project titled 'Advance Meter Infrastructure' under which smart meter will be installed and this meter will have capacity to communicate with the company directly without visit of meter reader. This project is at initial stage and they are doing bidding process.

Consumption and Consumers of LESCO

Chief Engineer informed that number of contract are approx 3.9 million. LESCO comprises on following five districts which covers 25 to 30 million of population .

- i. Lahore District
- ii. Qasur District
- iii. Sheikhpura District
- iv. Okara District and
- v. Nankana District

Further stated that LESCO has its share from 25% to 27% of the whole demand of electricity in this country excluding K-Electric because all Discos were the part of WAPDA and only K-Electric which has never been part of WAPDA. There are total 10 discos in Pakistan, out of which 25% to 27% electricity is distributed by LESCO to their consumers.

Categories of electricity contract

Chief Engineer informed that there are following categories of electricity contract under the domain of LESCO:

- vi. Domestic Connections
- vii. Commercial connections.
- viii. Industrial connections
- ix. Agricultural

Adoption of BCP-EP-2011

Chief Engineer informed that LESCO does not have review process regarding BCP-EP-2011 so far. However there is no problem for its adoption. If the relevant civic agency LDA desires/wants LESCO to be participated in the building approval process, LESCO can support it.

Sizes of transformers and capacity

On request of JST, Chief Engineer informed the following sizes of transformers being used in LESCO:

Capacity of transformer	Progressive upto the end of last month	During the month (nos)	At the end of this month
10-kVA	11,827	67	11,894
15-kVA	5,964	24	5,988
25-kVA	33,425	143	33,568
30-kVA	60	0	60
45-kVA	3	0	3
50-kVA	18,067	04	18,071
75-kVA	396	0	396
100-kVA	12,955	33	12,988
125-kVA	1	0	1
150-kVA	39	0	39
200-kVA	12,588	26	12,614
250-kVA	4	0	4
300-kVA	36	0	36
400-kVA	718	0	718
450-kVA	5	0	5
500-kVA	57	0	57
630-kVA	481	0	481
750-kVA	17	0	17
800-kVA	3	0	3
850-kVA	1	0	1
1000-kVA	72	0	72
1200-kVA	11	0	11
1250-kVA	21	0	21
1500-kVA	32	0	32
1600-kVA	7	0	7
2000-kVA	29	0	29
2500-kVA	13	0	13
2800-kVA	1	0	1
3000-kVA	1	0	1
3500-kVA	1	0	1
5000-kVA	3	0	3
Total	96,838	297	97,135

Above figure transformer has been installed by LESCO by June, 2015. Further stated that if any industry wants more capacity transformer, they can install individually. Chief Engineer also elaborated the transformers:

- i. 10-kVA: It is for single house in rural areas. It is single connection which has 8kVA on demand of customer in the rural areas, industrial area whose level is upto 8kVA.
- ii. 15-kVA: Same as of 10-kVA.
- iii. 25-kVA: It has been designed for industrial connection and for street lights, water supply schemes in the rural area for irrigation.

- iv. 50-kVA: Same as of 25kVA
- v. 100-kVA: Designed for distribution of electricity to water supply, agricultural tube-well etc.

Peak time and peak demand

Chief Engineer informed that LESCO is observing following peak times:-

- i. Summer season: peak time is from 05:00 p.m. to 11:00 p.m. (6 hours)
- ii. Winter season: peak time is from 05:00 p.m. to 10:00 p.m. (5 hours)

Opinion: Chief Engineer gave his opinion for consumption of electricity. He stated that industrial connections are consuming 40% to 42% energy of LESCO which is approximately 2% in number of contract of LESCO. LESCO is receiving 40-45% revenue from industrial sector.

40-50% of factories are operating in peak hours in which 3 shifts are applied. Steel industry does not work in peak hours but textile sector is operating in peak hours.

Demand Curve

LESCO has handed over demand curve of Daily Average for 16th Jul, 2015 to JST . This information is obtained automatically from meter installed on the grid system.

- A) Load Drawn (actual load): This demand curve includes stealing, defective meters, and load shedding as well
- B) Allocated load: Allocated to LESCO from grid (NTDC has power to control grid). (excludes K-electric)
- C) Demanded load

Note:

Difference between Demanded Load & Load Drawn is the impact of load shedding.

In case that Load Drawn is greater than Allocated load, Shortage of load is being covered by the neighboring Energy Supply Company (ESCO) grid.

Cooperation of LESCO with sub-contractor (Designmen)

On request of JST, Chief Engineer assured the help of LESCO and stated that they are ready to provide any kind of information as well help to JST. For cooperation with Designmen, LESCO appointed Mr. Tariq-Commercial to assist/help the Designmen as and when is required.

MEETING MEMO

Date	27 th August, 2015	Time	5:00 p.m to 6:00 p.m
Organization	Ghani Glass Manufacturers, Lahore Venue: 39L, Model Town Extension Lahore		
Department			
Attendances	Ghani Glass Manufacturer: <ol style="list-style-type: none"> i. Mr. Shahzad Baig, General Manager ii. Mr. Zaid Ghani, Chief Operating Officer iii. Mr. Waqar Ahmed, Manager (HR). JST: Mr. Hirooka, Mr. Kuroki, and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction</u></p> <p>At the inception, JST thanked the Ghani Glass Manufactures for arrangement of the meeting and presented the activities, objectives and backgrounds of the data collection survey on energy efficiency and conservation in the building sector of Pakistan and informed that Government of Pakistan through Pakistan Engineering Council has formulated and duly notified Building Code of Pakistan (Energy Provision-2011).</p> <p><u>Over view of Ghani Glass Manufacturers</u></p> <p>General Manager stated that:</p> <ul style="list-style-type: none"> • Ghani Group is a reputed business house in Pakistan with interests in float glass, container glass and value added glass, automobiles, beverage products and mining for silica sand, coal and rock salt. • Over 50 Years of experience in glass related raw materials and glass manufacturing. • The group's dedication to quality and customer service enabled it to achieve an exclusive 25 year excellence certificate from Philips. Electric Company • The group operates a diverse range of businesses, including five modern glass manufacturing plants, an automobiles Industry, beverage company and a number of mining companies. • With Glass as group's core business; the flagship company of the group is Ghani Glass limited; the largest glass producer of Pakistan. • Ghani Glass Limited was listed on Karachi and Lahore stock exchanges in 1992. • Ghani Glass features four modern glass plants in Pakistan producing float glass and container glass with annual capacity of approx. 300,000 tons. • Annual average of sales in building glass is about 150,000 tons which is approx 10,350,000 m² of glass panel. • Commitment to quality and customer care have enabled the company to achieve dominant market shares in Pakistan with float glass at 73%, pharmaceutical glass containers at 90% and Foods & Beverages glass containers at 76%. 80 dealer are established in Pakistan. 		

- The group's glass plants were the first ones to achieve ISO 9001:2000 & 14001 certifications in Pakistan. These have now been upgraded to ISO 9001:2008 & ISO 14001:2004.
- Pioneer in introducing GMP Standards in glass manufacturing.

Ghani Glass Manufactures activities

General Manager stated that their brand is the most recognized in the glass industry of the region. Strong market share, largest glass production, most sophisticated plant and machinery, turbo paced innovation, strict adherence to international quality procedures, apt human resource, global exports of quality glass products and decades long success track record, all have paved the way to the destination of being the market leaders in the region. He further stated that Ghani Glass has a superlative advantage over others, as Ghani itself owns and operates largest silica sand mines (the basic raw material in glass production) in Pakistan in the private sector. Giving it a great strategic competitive point of difference, it facilitates Ghani to achieve low production costs while ensuring high quality of raw material, ensuring the finest quality glass production and delivering best quality to customers, globally.

He stated that Ghani is producing various type of glass that includes float glass, containers glass packing (bottles), body tinted glass, reflected glass, hard core glass, double glaze, mirror, soft quoted glass etc.

Recognition of BCP-EP-2011

General Manager vehemently stated that they know very well about BCP-EP-2011 but unfortunately it is neither being followed or implemented in Pakistan. They try to convince the people for using of double glazed window but people do not prefer it due to high unit costs. Since window/ glass purchase order is to be made after structure completion, client often compromise the performance if construction cost has been already gone higher than their plan. Ghani were very much in touch with the relevant organizations like ENERCON for implementation of such code but nothing has yet been improved.

Suggestions for implementation of BCP-EP-2011

They stated that following barriers, issues and ideas . Also stated that Energy Efficiency for the Building sector would not be archived without government support.

- People should be educated at large level so that they could be able to understand that how to conserve energy by implementing BCP-EP-2011.
- Builders, Developers, Architects, Engineers, Structural Engineers should also be very clearly directed to follow these codes with certain penalties.
- Incentives for the people who follow such codes.
- 20% people are rich and capable to invest for high performance specification. Benefit of initial investment to be educated to those groups. Once recognition and usage by those group is improved, other group will follow.
- Above 20% people tends to engage architects for their custom design house. Education for the local architects are essential.
- If the government does not take incentive initiative, nobody would like to follow it voluntary and even mandatory. For example, LEED USA provides incentives to those who comply with building

standards in USA. Such scheme can also be applicable in Pakistan.

- vii. Government should also provide incentive to the manufacturers like Ghani in terms of tax exemptions on production so that they can manufacture glass on cheaper rates and ultimately everyone would be able to use required performance product.
- viii. Not only glass cost, window frame cost is also the barrier. To accommodate double glass, aluminum window profile has to be made for it. Since market share of double glass is very low, window frame cost for double glass is also being very high.
- ix. If size of window is standardized, cost for double glazing window may become reasonable.
- x. If rebate is given to manufacturers, production would be cheap which will ultimately be beneficial for the people of Pakistan.
- xi. In double glazing window, both glass and frame unit cost is double or more in comparison with single glazed window. In total, double glazing window is 3-4 times more expensive than single glazed window.
- xii. Aluminum frame to fix window's price is generally Rs 400-450 per sq. ft double glaze. And roughly the frame for single glaze's price is Rs 200-220. Therefore, government should also provide incentives to aluminum manufacturing companies for production of cheap products.
- xiii. All development authorities must clearly be directed to see that BCP-EP-2011 is being implemented in true letter and spirit, if not complying; there must be serious penalties against the delinquents.

Current usage of double glass

General Manager stated that projects using double glazed are limited to mega projects i.e. 5 - 10 million US dollar or more. Those projects are designed by the foreign Architects. In his opinion, the double glazed is being used in Pakistan less than 2% for new construction. Window glass's cost is less than 2% of total amount of the building.

Glass manufacturing standards

General Manager informed that they are following the double glazing and tempering standards according to International Standards.

Decision making for single glass or double glaze

General Manager informed that decision making for single glass or double glaze is between the owner and designers. Usually owners go for cheaper materials. Therefore, making sure of double glaze is only possible if the Government of Pakistan takes serious initiative because GoP has resources for its implementation. He further said in Dubai 90% of projects are following double glazed because the Government is so strict and building codes are being enforced truly. Similarly in Pakistan, Government Agencies are slow for implementation of such a national cause.

Certification of glass performance testing

General Manager stated there is no such facility available in Pakistan, therefore, Government of Pakistan should establish an autonomous body which could be able to provide such facilities. Presently they have to get their glass tested from USA.

He further stated BCP-EP-2011 also does not lay down any testing system for glass and insulation. Government should ask every manufacturer for testing the products.

He stated as Ghani Group is also carrying out some social activities like education for poor, therefore, they can help in establishing testing facilities for glass.

Training of Architects

General Manager stated that very few Architects in Pakistan are educated and familiar with their work, rest of all are not able to understand the modern trend. Therefore, they need to be educated at first because they have degrees and do not have exposures.

MEETING MEMO

Date	27 th August, 2015	Time	3:00 p.m to 4:00 p.m
Organization	Punjab Industrial Estate, Government of Punjab Venue: PIE Head Office, Sundar Industrial Estate, Lahore.		
Department			
Attendances	PIE: <ul style="list-style-type: none"> i. Mr. Iftikhar Hussain, CEO ii. Mr. FAree Ahmed, Chief Engineer (Electrical) iii. Mr. Ahmed Munir Dy Manager (Administration) iv. Mr. Umar Saeed Chief Engineer (Civil & Tech) v. Mr. Aftab Ahmed, Assistant Manager (Projects) JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Sharing and presentation of Inception Report.</u></p> <p>JST thanked the Punjab Industrial Estate for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the Agenda point by point to the participants of the meeting. JST further introduced case studies of other countries regarding energy efficiency and conservation in the building sector and stated that government of Pakistan through Pakistan Engineering Council has formulated building bode (energy provision-2011), but most of the development authorities in Pakistan has not yet adopted such code. On request of Chief Engineer, JST explained the energy efficiency and stated EE is to use very efficient equipments like A.Cs, lighting, hot water, building envelop and putting proper insulation can conserve energy.</p> <p><u>Load shedding</u></p> <p>PIE informed that presently they are facing load shedding of 4 hours and it can go upto 12 hours. Load shedding is not the problem of PIE, but its for all Pakistan. They stated that they get electricity supply on one point from WAPDA then they distribute themselves to its industry. They also got license of power generation from NEPRA. Whenever they need electricity, they get it on rent. They are also planning to install 100 Mega Watt project for supplying electricity to Government of Punjab and 20 Mega Watt for PIE. Further stated that they have their own grid station and generators to cater this load shedding problem but they need advance electricity technology testing method to meet this challenge.</p> <p><u>Energy Efficiency Effort in PIE</u></p> <p>PIE informed that they cannot order the existing industrialists to improve building energy efficiency, such as thermal insulation on building. Currently Industrialists are doing their energy efficiency effort at their own interest which makes economic sense. Industrialists have their own management board consisting upon themselves. PIE stated that up to today, they did not aware of BCP-EP-2011 and if the Government of Pakistan orders the industry to follow these codes, then it can be mandatory. As far as PIE understands,</p>		

Government of Pakistan has not given any direction to do so.

PIE further stated that convincing people to follow BCP-EP-2011 is not easy without incentive. If government takes such initiative with some incentives, then it can be possible.

Responsibility to follow BCP-EP-2011(Building Code of Pakistan Energy Provision 2011)

JST stated that according to BCP-EP-2011, confirmed by PEC, those codes are mandatory. the responsibility of code compliance is under registered architects, engineers, and builders even though respective Development Authorities has not adopted BCP-EP-2011 in their review process.

PIE Building Control Authority

PIE informed that they have complete division (Building Control Authority) which consists upon approx 15 persons.

- i. Manager
- ii. Dy. Manager
- iii. Assistant Managers
- iv. Site Inspectors

This authority checks the building designs and ensures necessary measures for construction activity in the Industrial Estate. On request of JST, they informed that they do not exactly know the profession/ number working in Building Control Authority including its regional offices.

They further stated that whatever inside the wall of Sundar Industrial Estate is entirely governed by PIE and its Building Control Authority. PIE manages everything even traffic management in PIE. So LDA is not carrying out their inspection in Sundar Industrial Estate.

Upon request from PIE, JST handed a copy of BCP-EP-2011 for their Building Control Authority.

Building code of PIE

They informed that PIE does have its own building code for construction of buildings in the Sundar Industrial Estate. If any industry has to construct their buildings, they have to apply to PIE. PIE manages such activities transparently and fairly. The Building code of PIE is referring Building Code of Punjab with some amendments.

How to attract industrialist for Industrial Estate

PIE stated One Window Operation System(OWOS) is important and has been successful. OWOS provides building permission, buildings maintenance solutions, electricity connection, water supply connection, security matters etc so that industrialist does not have to consult and or apply required activity. If anyone has problem, he/she has to go to one window for solving their problems quickly and efficiently. They also provide electricity underground and very clean environment, therefore, a lot of attractions in PIE due to which people prefer to come in PIE. Presently there is no land available in Sandar Industrial Estate because

of full occupancy.

Further stated that there is strong demand from industrialists to come in PIE. In order to meet the demand of industrialists, PIE are going to acquire land to facilitate the industries. They are planning 26 industrial estates in the entire Punjab. Presently they have 8 industrial estates. Other 18 are in pipeline and at planning stage for the big cities of Punjab.

Residential colonies in PIE

PIE informed that in Lahore, there is no residential facilities within the Industrial Estate. People are commuting from the residential area nearby. However, in regional offices like Multan, There in a Industrial Estate which includes residential colonies and commercial areas.

Purchasing of plot from PIE on loan or direct payment.

They stated that PIE primarily acquires the land and sells it to for industry either on full cash payment or in installments. PIE is not involved in the industrialists financial support. Under the purchasing contract, following facilities and services are included inside the wall of PIE.

- i. Electricity connection
- ii. Water supply connection
- iii. Proper security.
- iv. Rescue services.
- v. Sanitation services.
- vi. Other necessary utilities like

They further stated that at the moment, they have various multinational industries in PIE which includes Pepsi, Coke, BOC etc.

MEETING MEMO

Date	27 th August, 2015	Time	11:00 a.m to 12:00 noon
Organization	Punjab Revenue Authority (PRA), Lahore Venue: 5B Danapur Road, GOR-I, Lahore.		
Department			
Attendances	PRA: <ul style="list-style-type: none"> i. Mr. Javed Ahmed, Commissioner (Enforcement) ii. Mr. Salman Ali, Additional Commissioner. JST: Mr. Hirooka Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction and presentation of inception report.</u></p> <p>At the inception, JST thanked the PRA for arrangement of the meeting and presented the inception report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and also explained the background and objectives of the survey.</p> <p><u>Role and functions of PRA</u></p> <p>Commissioner stated that PRA deals with sales tax on services. It does not deal with property tax. VAT is charged on both goods and services. VAT is charged on every supply or sale or rendition stage of goods and services in the commercial chain of production, distribution and consumption. There are several forms of VAT in the world but the one based on tax invoice-related credit mechanism is considered to be the ideal type because of its inbuilt automatic system of converting multi-stage tax assessments into a simple stage levy.</p> <p>PRA has its four regional offices situated in Gujranwala, Rawalpindi, Faisalabad and Multan respectively for collection of revenues. GDP in terms of provincial tax collection is 0.8%. Similarly percentage of GDP at federal government level is 9-10%. (11.1% in 2013)¹</p> <p>Tax rates change from time to time. Some tax item rates increases and some item rates decreases. Presently highest tax rate is 19.5% only for telecommunication services and lowest/general tax rate is 16%.</p> <p><u>Taxation system regarding building sector in Punjab</u></p> <p>JST requested to know the taxation system in the building sector of Punjab. Commissioner informed that at the moment they do not have any special tax exemptions in the building sector of Punjab. If there is any fully funded programme by foreign agency, then such exemptions can be provided by the Federal Government. He further stated that following two kinds of exemptions in Pakistan prevalent.</p> <ul style="list-style-type: none"> i. Statutory exemption: ii. Notified exemption: Government of Pakistan can grant such exemptions by notifying it. <p>Generally, tax rate in Punjab is 16%. Labour is not taxable but if it is supplied by any registered contractor, then labour is also taxable.</p>		

¹ World Bank Indicator

Property Tax: PRA informed that they do not deal with the property tax. Property tax is the subject of Punjab Excise and Taxation Department which deals with residential property, commercial, industrial and agricultural property.

Sale Tax (VAT): VAT is charged on every supply or sale or rendition stage of goods and services in the commercial chain of production, distribution and consumption. There are several forms of VAT in the world but the one based on tax invoice-related credit mechanism is considered to be the ideal type because of its inbuilt automatic system of converting multi-stage tax assessments into a simple stage levy.

PRA deals with sale tax on services, rate of which is 16%. If any maintenance company has to provide maintenance/solution services, they are required to pay tax to PRA @16%. As far as building code is concerned, they are not providing any tax exemptions at the moment, if the Government decides to provide such schemes, it will be beneficial.

JST informed that it has been advised to visit PRA being provincial department which collects property tax. PRA informed it is not their matter.

He further stated that federal government is dealing with income tax, custom tax, tax on services and tax on goods.

Provincial Departments dealing with Tax

Commissioner stated that in the Province of Punjab, there are following three government departments are working for taxation.

- i. **Provincial Excise and Taxation Department:** It deals with taxation on property and on alcohol etc.
- ii. **Board of Revenue:** It deals with taxation on land and agriculture side.
- iii. **Punjab Revenue Authority:** It deals with sale tax on services. In addition, it also collects Cess on infrastructure development. But this cess has been introduced in this year and it started on 1st July, 2015.

Penalties

Commissioner PRA informed that there are penalties available for those who are taxable entities and do not pay taxes. He further referred to Chapter-VIII, section-8 of Punjab Sales Tax on Service Act, 2012. **Section-48. Offences and penalties.–**

(1) If a person commits any offence described in column 2 of the Table below shall, in addition to and not in derogation of any punishment to which he may be liable under any other law, be liable to the penalty mentioned against that offence in column 3. (2) The sections referred to in column 4 of the said Table shall be deemed to be meant for illustrative purposes only and the corresponding offence described in column 2 may fall and be prosecuted under other sections of this Act as well.

Penalty1: Any person who is required to apply for registration under this Act fails to make an application for registration before providing any taxable services Such person shall be liable to pay a penalty of ten thousand rupees or five per cent of the amount of the tax he would have been

liable to pay had he been registered, whichever is higher.

In the case of non-compliance of compulsory registration, the minimum penalty shall be ten thousand rupees: If such person who is required to get himself registered under this Act, fails to get registered within ninety days of providing taxable services, he shall be further liable, upon conviction by a Special Judge, to imprisonment for a term which may extend to one year, or with fine which may extend to the amount of the tax he would have been liable to pay had he been registered, or with both.

Penalty2: *Where any person fails to furnish a return within the due date . Such person shall be liable to pay a penalty of five thousand rupees provided if a return is not filed within fifteen days of the due date, a penalty of hundred rupees for each day of default shall be levied.*

Where any person fails to deposit the amount of the tax due or any part thereof in the time or manner laid down under this Act or the rules.

Penalty3: *(a) Such person shall be liable to pay a penalty of ten thousand rupees or five per cent of the tax payable for that period, whichever is higher.*

(b) If the amount of the tax due is not paid even after the expiry of a period of sixty days of issuance of the notice for such payment by an officer, not below the rank of Assistant Commissioner, the person shall be further liable, upon conviction by a Special Judge, to imprisonment for a term which may extend to three years, or with fine which may extend to the amount of the unpaid tax, or with both.

(c) No penalty shall be levied if any miscalculation is made for the first time during a year.

Penalty4: *Any person who fails to maintain records required under the Act or the rules. Such person shall pay a penalty of ten thousand rupees or five per cent of the total tax payable for the tax period for which he has failed to maintain the required record, whichever is higher.*

Penalty5: *Where a registered person who, without any reasonable cause, in noncompliance with the provisions of this Where such a person is a company, it shall be liable to pay a penalty of ten thousand rupees.*

Punjab Sale Tax on Services Act, 2012 also provides other penalties which can be seen in this Act Chapter-8 and section-48.

Barriers

Commissioner stated that PRA is newly established provincial department and gaining method for revenue collection. It faces following barriers:

- i. It has narrow tax base because not all taxpayers are paying taxes.
- ii. PRA has only 12000 registered taxpayers which needs to be increased.
- iii. PRA facing human resource impediment because they do not have adequately trained staff.

- iv. Not all private sector pays tax.
- v. Majority of tax payer are Government officers only who pays tax out of their salaries.

Cooperation for exemptions

Commissioner informed and assured cooperation and stated that exemptions can only be granted if the Federal Government decides to do certain programmes. Similarly, if certain exemptions are introduced on building sector, it will eventually conserve energy.

Data of residence, commercial and industrial buildings

Commissioner stated that as they are not dealing with property tax, therefore, they do not have such data. Such data can be got either from Provincial Excise and Taxation Department Lahore being relevant property tax collecting agency or from Punjab Bureau of Statistics, Lahore. JST will follow up as necessary.

MEETING MEMO

Date	28 th August, 2015	Time	11:00 a.m to 12:00 noon
Organization	Energy Department Government of Punjab Venue: 8 th Floor, EFU House, Lahore.		
Department			
Attendances	Energy Department Punjab: i. Mr. Asad Rehman Gilani, Secretary ii. S. Ashar Abbas, Deputy Secretary (Solar) iii. Mr. Iftikhar Ahmed Randhawa, Chief Engineer JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Sharing and presentation inception report.</u></p> <p>JST thanked the Energy Department Government of Punjab(EDGP) for arrangement of the meeting and shared Inception Report of data collection survey on energy efficiency and conservation in the building sector of Pakistan and explained the background and objectives of the survey. It was also informed that counterparts of this project are ENERCON and Pakistan Engineering Council. JST also informed that JST heard that GIZ is doing capacity building program with EDGP. JST further informed that government of Pakistan through Pakistan Engineering Council has formulated building code (energy provision-2011), but most of the development authorities in Pakistan has not yet adopted such code.</p> <p><u>Energy crises and projects in Punjab</u></p> <p>Secretary stated that at present in Punjab, there is a demand-supply gap of about 4000 MW which is increasing at a rate of 6% per annum. They have been working on demand side of power. They have five years plan to cater the energy crises in Punjab for that they have requested the Government of Punjab for allocation of budget of 5 billion rupees and they hope that some of money will get released.</p> <p><u>Goals and objectives:</u></p> <p>EDGP stated that their goals and objectives are very clear and they have multi strategies to cater energy crises with consultation of consultants. At present they have support from International Agencies which include USAID, DFID, GIZ. They also welcome any kind of support or collaboration from JICA. In addition, they have also planned to utilize their own funds.</p> <p><u>PEECA</u></p> <p>Secretary informed that they are going to establish an independent agency named Punjab Energy Efficiency and Conservation Agency (PEECA) soon. In next one or two weeks, they are going to have meeting with the Planning Division, Government of Pakistan which decides the public sector program.</p> <p><u>Involvement of IFC</u></p>		

Secretary stated that they keep in touch with IFC. They have already hosted various meetings lead by IFC in which they gathered different stakeholders in one platform to get their opinion regarding energy efficiency and conservation. IFC might go to supply consultants and grant for establishment of PEECA.

Collaboration with Federal Government.

Secretary informed that they are working with Federal Government and after approval of Pakistan Energy Efficiency and Conservation Act, they will be coordinating with Federal Government for implementation of energy efficiency.

Shifting of existing lights on LED lights

Secretary informed that they are planning to shift the existing bulbs into LED lights also considering motors, pumps. They need support if these things are available in market, and they have to ensure the cost of all these appliances is reasonable so that people would be able to install voluntary.

Energy efficient buildings with collaboration of GIZ

Secretary stated that they are going to construct a Energy Efficient Showcase Building (EESB) with collaboration of GIZ and they will apply any best technology available in the world. For that purpose, GIZ has identified and engaged Germany Firm as consultant. 7th Sep. 2015, they are going to have meeting with GIZ for EESB.

He further stated that soon they are going to invite Academia, Architects, Engineers, Constructors, Contracts in joint session to show them that how the energy can be conserved in EESB. For constructions of EESB, they already have land. Seven floors above ground with 2 underground floors is the building size they are in mind. EESB is going to be very expensive like 1billion PKR per floor. It is just rough estimate at this moment, actual cost will come after estimate of German Consultants. In these buildings, they will use double glazed windows, solar panel, LED lights, HVAC, elevators, insulation etc and then will see how much energy can be conserved. There is an idea of having ice in the basement floor for cooling purpose. Funding of this project is from Government of Punjab but he thinks Govt. of Punjab is not going to fund all cost to this building, therefore, they will have to get some fund from any other sources i.e. partners or any international donor.

Available data

JST informed that they have an idea to introduce software which can quickly evaluate building energy efficiency and study the possible options to compare initial investment and annual savings. JST stated that in order to adopt such software into Pakistan, it will require several data such as climate, HVAC, lighting, cost information, etc. Energy Department stated that they do not have HVAC data but can get such data from HVAC association. JST requested to know what is the A.C usage in household in Pakistan. They informed that at the moment they do not have such kind of data, they can arrange meeting with HVAC because HVAC might have such studies. EDGP also stated that whatever information JST needs, just send them

questionnaire, EDGP will reply to JST after collecting information from relevant entity or such energy consumption information can also be obtained from PETCO.

Cooperation or collaboration with Energy Department Government Punjab

Secretary stated that if JST is doing anything similar to EDGP, Both parties can collaborate each other. He further stated that it is Punjab Government Policy that are 1) Fast, 2) No compromise, 3) Transparency. That is why many international organization wants to come in Punjab. They are doing showcase for everyone in the world, therefore, requested JST to stay in touch. They have certain ideas also to provide incentive schemes.

Fans, motors, boilers

EDGP stated that after establishment of PEECA in Punjab, they will focus on fans, motors, lights and boilers because these products are consuming more energy at domestic side. Further stated that WASA is supplying water but does not have enough pressure. People usually use motors for two hours (1 hour morning and 1 hours evening) to pump up the water to their tank. They indicated that this motor usage is one of the main energy consumption in the household.

Organization Chart

EDGP will send by email as promised during meeting.

By-laws

EDGP will send by email as promised during meeting.

BCP-EP-2011

EDGP stated that after establishing PEECA, they will adopt BCP-EP-2011 because it is notified codes. At the moment, they are waiting for enactment of PEEC Act, after coming it into force, there will be an independent ENERCON and that will direct PEECA to work under guidelines of Federal Government.

They stated that in Energy Department, there are Electric Inspectors who are authorized to inspect particular buildings for safety issue. EDGP wish to conduct energy auditing on public buildings using those inspector, but at the moment, they are not able to do so due to the budget limitation. They further stated that Punjab is major agriculture based province and having irrigation water pumps 0.2, therefore, they can also save energy by focusing on this sector.

MEETING MEMO

Date	28 th August, 2015	Time	3:00 p.m to 5:00 p.m
Organization	Pakistan Green Building Council, Lahore Venue: GBC Head Office, Near Kalma Chowk, Lahore		
Department			
Attendances	Pakistan GBC: Mr. Aqrab Rana, Chief Executive Officer. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed			
<u>Introduction</u>			
<p>At the inception, JST thanked the Pakistan Green Building Council (herein referred to PGBC) for arrangement of the meeting and presented the activities, objectives and backgrounds of the data collection survey on energy efficiency and conservation in the building sector of Pakistan and informed that Government of our counterpart organizations are ENERCON and Pakistan Engineering Council (PEC).</p>			
<u>Pakistan PGBC objectives</u>			
<p>Mr. Aqrab Rana, CEO welcomed JST at PGBC Head Office and stated that following is overview, mission and objectives PGBC:</p>			
<u>Overview of PGBC</u>			
<p>PGBC is a non-profit organization committed to a prosperous and sustainable future for the nation through cost, energy, water and natural resource efficient green buildings and communities.</p> <p>It comes directly under the umbrella of World Green Building Council. The World GBC is a union of 102 national Green Building Councils from around the world including Japan and Pakistan, making it the largest international organization influencing the green building marketplace. Currently the Pakistan Green Building Council is a prospective member of the World Green Building Council.</p> <p>PGBC is the sole representative of the World GBC in Pakistan and the only organization in the country advocating, promoting, developing Pakistan specific green building guidelines and certifying sustainable building practices and products.</p> <p>Under the mandate of the World GBC, Pakistan GBC covers all the aspects that affect the environment such as subsoil Water levels, Water consumption and usage, Climate change, Deforestation, Carbon footprints, Air quality, Transportation, Agriculture, Industry, Renewable and Alternative Energy/fuel, Energy/fuel consumption and usage, Design of buildings, living patterns, Green Product / Building certification system and Environmental education at the grass root level.</p>			
<u>Mission of PGBC</u>			
<p>To introduce, promote and advocate sustainable concepts and practices to transform the way buildings and communities are designed, build and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.</p>			
<u>Objectives of PGBC</u>			

- Disseminate among the public the importance of using sustainable technologies in the process of designing, constructing, and operating buildings and zoned territories in order to achieve a sustainable environment with minimum damage to the surrounding environment.
- Raise public awareness in regards to the creation of a sustainable environment by means of presenting, elaborating, and encouraging technologies and practices that have minimum impact on the environment and create healthy and sustainable habitats.
- Assist in the elaboration and presentation of such technologies and practices for consumers and industry professionals in Sustainable design and construction.
- Educate industry professionals in Sustainable design and construction practices including but not limited to Energy efficiencies, Water conservation, optimal resource utilization, and indoor environment.
- Exert impact on the elaboration and implementation of any sustainable technologies and practices by promoting the achievements in this area among architects, builders, investors, and all stakeholders in regional development and public works on a local and national level.
- Render assistance to the government and other institutions towards creating legislation compatible with the international standards in the area of design, construction, and operation of buildings through the use of technologies and practices ensuring the creation of a sustainable environment specific to the region of Pakistan.
- Contribute towards the establishment in Pakistan of a standard for certification of Green Buildings and Communities.

Staff of PGBC

CEO informed that they started work in 2012 with 3 people. At the moment, they have staffs in the GBC office in Lahore as below:

- i. CEO
- ii. Director (operation)
- iii. Director (Registration & Membership)
- iv. Director (Research)
- v. Accountant
- vi. Two volunteers amongst PGBC members as Guidelines Committee.

He stated that since PGBC is new organization, they get volunteers amongst their registered members who give at least 4 hours weekly to work for promotion of green buildings in Pakistan. Further stated that at the end of this year, they will have all LEED certified staff in PGBC. People get online certification from LEED and currently about 15 LEED registered personnel are in Pakistan. He stated that found members support PGBC financially.

PGBC guidelines

CEO stated that PGBC has not yet framed its own guidelines in Pakistan, therefore, following LEED so far. PGBC approached USA GBC for guidelines in Pakistan, USA GBC offered to develop Pakistan guidelines with certain cost, but PGBC decided not to ask USA upon meeting with board member of PGBC and planning to develop own guideline.

Stages for membership in WGBC

CEO stated that there are following stages to become member of World Green Building Council.

- i. Associate Members
- ii. Emerging Members (Pakistan Green Building Council is at this stage, after preparation of guidelines, it will be established member)
- iii. Established Members.

Registration of Project with GBC

CEO informed that for green building project, LEED certificate, following stages are required:

- i. Registration of project (consent of the owner for registering with GBC)
- ii. Design Stage (specifications green building)
- iii. Construction Stage (Inspection carried out)

He stated that main motivation for clients who decides to obtain LEED certificates are 1) benefit to save running cost by maximum 40%, and 2) international recognition.

Market/Green buildings in Pakistan

CEO stated that green building concept was introduced in 1993. First project, in the year 2009, there was only one green building in Pakistan. Second project was registered in the year 2011. Now they there are 25 registered green buildings in Pakistan. GBC has set there road map which is targeting 100 projects by 2016, 250 projects by 2017. Until PGBC establish their own guideline, US LEED certification is the basic criteria. Due to high initial cost, most of people are reluctant to apply green buildings. PGBC has been promoting the idea and benefit of the green buildings, which may save 40% of electricity bills, however most of the people are not convinced. Roughly 70 % of people do not believe the benefit of green building. Awareness and education is essential.

There are several technical issues in Pakistan. To make sure designed envelope performance, window frame has to be installed without gap between the frame and wall. Also, sliding windows are popular in Pakistan, however, air-tight performance needs to be improved.

Informal settlements

CEO stated that construction is informal sector in Pakistan. People buy land and go for construction without consulting the architects. To obtain permit from relevant Development Authority, they go to Architects and get registered architects stamps on payment. Similarly, electricity is also informal sector in Pakistan because people build their house and go for electricity connection by themselves. DISCO does not approach the relevant development authority to check whether the house has been built in accordance with the official process or not. He also given examples of US Green Building Council and stated that if drainage/design document does not match with the construction in USA, USAGBC does not issue certificate of green building.

Shortage of housing units in Pakistan

CEO said since the year 1998, GOP stated that 500,000 housing units supply is required annually. Annual housing construction has been limited at maximum of 200,000 units per year and now 9 million housing

units is in shortage in Pakistan. Statistics about housing units in Pakistan may be obtained either from ABAD or from Planning Division, Government of Pakistan.

Environment as Provincial subject in Pakistan and implementation of BCP-EP-2011

CEO informed that at the moment environment has become provincial subject constitutionally, therefore, provincial government should immediately pay attention in order to protect environments as well as energy for the nation.

BCP-EP-2011

CEO stated that they have been trying to bridge between public sector (Government), but Public sector does not share anything. Further stated that government carries out all activities secretly and one day come up for publishing of documents like BCP-EP-2011. Therefore, private sector does not want to adopt such codes. Furthermore, Government did not invite the private sector while preparing such code. He said for example, he knows one of the member of Task Force mentioned in this book is not happy with BCP-EP-2011 document. Similarly other private Architects, Engineers, contractors, developers are not happy even some of them do not know about these codes.

He said document is there, without any incentive for the public.

Awareness for green buildings

CEO informed that people are not aware of green buildings concept in Pakistan. They usually do sessions, seminars wherein they invite relevant stakeholders which include architects, constructors, builders, developers, students from universities to educate them the concept of green buildings. Pertinently people do not believe on green building concept due to lack of education.

Lack of institutions: CEO stated that there are very few institutions involve in imparting technical education regarding green building and energy efficiency and conservation in Pakistan.

Non Collaboration of Ministries: CEO stated there are Ministries of climate Change, Water and Power and Planning Division working on sustainable development but interaction between the ministries seems not enough. For example following relevant organizations are working on building sector improvement but they do not invite other consultants, engineers, architects etc. They work in their own directions.

Going Forwards

At the end he assured his cooperation with the JICA Study Team and stated that whatever information they got from their projects on ground regarding green building in Pakistan, they will share by email as soon as possible. CEO was also interested in JST view of Pakistan's issue. Both party agreed on further interaction.

MEETING MEMO

Date	31 st August, 2015	Time	15:00 to 16:00
Organization	Sindh Building Control Authority (SBCA). Venue: Hussain Square, Civic Center, Gulshan-e-Iqbal, Karachi.		
Department			
Attendances	Sindh Building Control Authority (SBCA): i. PLNR. Nadeem Ahmed Khan - Director, ii. Engr. Ali Mehdi Kazmi - Director, JST: Mr. Hirooka, Mr. Kono		
Obtained Documents	i. Organization Chart ii. Number of proposed plan, approved plan, demolition		

Discussed

Number of staff.

1. Number of staff in SBCA is about 2200 in total, 6-700 technical staff, and are distributed in several regional offices. 5 regional offices, Karachi(HQ)/ Hyderabad/ Sukker/ Mirpurkhas/ Larkana, are covering entire Sindh Province with exception of the area for Military facilities, Defence Housing Authority and Sindh Industrial Trading Estate.
2. There are 18 district divisions in Karachi HQ Area where at least 5 technical staff are carrying out drawing review as well as site inspection. In case of the district where many construction projects are happening, number of inspector has been increased accordingly. Typical structure is Director, Deputy Director, Assistant Director, Senior Inspector and Building Inspector.
3. Apart from above district divisions, there is a structural division where all submitted structural drawings and calculations are reviewed and approved. There are 12 structural engineers in the division, due to the large number of building application, 75% of drawing review are being outsourced to private sector.
4. JST handed questionnaire for other regional offices (Hyderabad/ Mirpurkhas/ Sukkar/ Larkana). Director will forward them to relevant regional offices.

Number of buildings

5. Confirmation of the table showing number of buildings in last 5.5 years in Karachi Region (2010-July 2015)
 - A) Plan received (23,478): This number indicated application.
 - B) Proposed Plan (14,711): This number indicate SBCA approved plan but did not carry out final inspection because building owner did not apply final inspection. In SBCA opinion, 90% of those buildings have been completed and being occupied without final inspection and occupancy certificate. Remaining 10% could be 1) did not start construction, or 2) stopped construction, for some reason.
 - C) Completion Plan (1,101): This number indicates officially certified buildings. This is 5% of building application and 7% of approved plan.
 - D) Plan Approved (15,812): This number indicates total of "Proposed plan" and "Completion Plan" by SBCA. This is 67% of applied plan to SBCA. Remaining 33% are 1) rejected by SBCA or 2) withdraw by applicant or 3) suspended by some other reason. Some applicant might have decided

to go ahead for construction without plan approval.

- E) Number of Demolition (4983): This indicates number of demolition carried out by SBCA demolition department due to non code compliance. Some are entirely demolished, some are partially demolished. This is 21% of number of applied plan. Some demolition might have been carried out for illegal construction without application.

SBCA Police Station

6. The role of SBCA Police Station: In case of resistance from building owner or contractor, demolition department request to support SBCA Police Station.

Regulation

7. Penalty for occupancy without completion certificate is 5PKR/ ft² for both residential and commercial. (Karachi Building & Town Planning Regulation Amendment 2011)
8. Currently KB&TP is referring UBC (Uniform Building Design) and American Code or British Code for structural design criteria. However, SBCA is in progress of adoption of Building Code of Pakistan Seismic Provision 2007.

BCP-EP-2011

9. In the KB & TP, there is a section to regulate lighting and ventilation, however any regulation similar to Building Code of Pakistan Energy Provision 2011(BCP-EP-2011) are not yet adopted in KB&TP. SBCA would consider adoption of BCP-EP-2011. The procedure will be apply to SBCA board for approval, after government approval, revision to KB&TP will be officially notified.
10. Director stated that about 3-4% of building application is 1000m² or more. This number is much smaller than the number of building required structural design review. So Director feels adoption of BCP-EP-2011 should be smooth once they establish review division specialized for BCP-EP-2011 similar to their structural division.

MEETING MEMO

Date	31 st August, 2015	Time	11:00 to13:00
Organization	House Building Finance Company Limited, Karachi Venue: HBFCL office		
Department			
Attendances	HBFC: Mr. Perves Said, Managing Director Mr. Farrukh Riaz, Vice President/ Head of HR JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed			
<u>Objective of HBFC</u>			
<ol style="list-style-type: none"> 1. Housing Building Finance Company Limited (HBFC) was established in 1952 as Government statutory institution and incorporated in 2006 under the Companies Ordinance , 1984, Ministry of finance is the 100% share holder. 2. HBFC is focused on the financial support for the people of Low to Middle-Low income group. Since 1952, accumulated value is 54 bill PKR with 470,000 people. Currently holding 13 bill. PKR with 54,000 account holder. 			
<u>Building cost, finance amount and interest rate</u>			
<ol style="list-style-type: none"> 3. Buildings cost is about 1,000-1,500PKR/ ft². Major Low-income houses are 450,000 to 1,300,000 PKR with 50-100 yard² floor area. Account holder borrows 300,000-700,000 PKR from HBFC at maximum period of 20 years. 4. Depending on the location of the house, HBFC is able to lend 70-50% of construction cost to account holder. Criteria is that 1) land as mortgage, 2) borrower shall have certain income. 5. Interest rate is depends on the rate issued by Karachi Interbank Offered Rate (KIBOR). HBFC interest rate is currently 10-11% (KIBOR rate(6-7%) + 3.22%. 			
<u>Issues , Barriers and possible improvements</u>			
<ol style="list-style-type: none"> 6. There is no subsidy driven by Government. Government is requesting more finance support to HBFC to fulfill housing shortage, however, HBFC is enable to finance to those who do not qualify said criteria which has been instructed by government. 7. Finance to Low-income group tends to face to risk easier, such as Flood, Load shedding, Funeral, Marriage etc. 8. Although HBFC lends money to borrower, HBFC pays their money directory to builder. From that perspective, it will be possible to request to certain specification to builder. 9. HBFC stated that possible ideas to improve current finance situation is 1) subsidy or cross subsidy, 2) Control Speculation by developer 			

Basic information of Low, Middle-Low income group lifestyle and building typology

10. Low-income
 - A) Family total income: 100-150 USD/ month
 - B) 2 light bulbs, 2 fans, iron ?, wash machine?, refrigerator?
 - C) Electrical usage 50-100kWh, monthly electric bill 1000PKR
11. Low-Middle Income
 - A) Family total income: 200-500 USD/ month
 - B) 4 lights, 3 fans, Wash machine, refrigerator, Iron, No AC
 - C) monthly electric bill 3000PKR
12. Middle Income
 - A) Family total income: 500-1000 USD/ month
 - B) 6 lights, 4 fans, Wash machine, refrigerator, Iron, 2 AC
 - C) monthly electric bill 15,000PKR
13. Roof Construction of Low-income hose are mainly as described below.
 - A) Reinforced Concrete Slab
 - B) Pre-fabricated panels laid on beams
 - C) Bricks on beams

Problem of those brick built house is that heat in summer. New technology should be affordable in cost, acceptable in cultural.

MEETING MEMO

Date	1 st September, 2015	Time	11:00 to 13:00
Organization	Pakistan Council of Architects and Town Planners (PCATP). Venue: PCATP head office, Karachi.		
Department			
Attendances	PCATP: i. Ar. Sikandar Hayat Khan - Chairman, ii. Ar./ Plnr. Tahira Sadia Fazil - Registrar, JST: Mr. Hirooka, Mr. Kono		
Obtained Documents	i. Annual Report 2014 PCATP		
Discussed			

Organization.

- There are 13 executive committee member which elected by registered members in every two years. 1 Chairman, 2 vice chairman (Architect & Town Planner), 6 Architects from each provinces, 4 Town planners.

Ordinance

- PCATP Ordinance IX of 1983 to make provision for the regulation of architecture and town planner. Revision to Ordinance requires several process, however the revision to the Bye-Law can be approved by executive committee. (20% of member have to agree on it)
- Current registration requirement for architect is to hold 5 year Bachelor of Architecture from accredited Institutions in schedule 1 & 2 in PCATP ordinance.
- PCATP is currently in progress of revision to Ordinance regarding registration requirements. Proposed requirements it to add examination process after at least 2 year experience with minimum CPD course attendance. CPD (Continues Professional Development) course will be established in reference of RIBA (Royal Institute of British Architects). PCATP is aiming to revise Ordinance by 2016.
- PCATP and HECP (Higher Education Commission Pakistan) has exchanged MOU regarding financial support of new CPD establishment.

Registered Architects and Town Planner

- According to the annual report 2014, total number of Architects and Town Planners are shown below.

	Registered	Paid up annual fee	Removed	Deceased
Architect	4586	2435	2039	112
Town Planner	939	363	557	19

In order to carry out professional practice in Pakistan, Architects and Town Planner shall registered under PCATP. Architect, who does not hold registration, are 1) not in the profession anymore, 2) working under registered architect or 3) working illegally by using registered architects name.

- PCATP indicated that one of the issue in Pakistan is that registered architect allows to use their name and stamp on non-registered architects drawing on payment.

Accredited Institution

8. The number of accredited Institution in 2009 was 6. However, Number of institutions that have architectural course will be increased to 32 in 2016. PCATP has accredited 16 institution so far and remaining are in the process of accreditation.
9. Rapid escalation of number of architects and institution are observed in last 5-6 years. This has been driven by strong demand in Pakistan as well as neighbouring country.
10. In PCATP opinion, skill level of graduated students from accredited institution are various. 4-5 Institutions are producing quality professionals, quality of skill are depending on 1) quality of teacher, 2) number of student in the class. PCATP further indicated that in general, architects course in engineering institution tends to have too many students in the class and do not have enough training on drawing skill.

Building sector general information in Karachi

11. There are many non-code compliant buildings in Karachi. Also building code to be revised such as parking requirement. Due to the lack of parking space in the buildings, there are so many cars parked along the road.
12. In PCATP opinion, 90% of low-income housings are designed by non registered architect. For the application purpose, registered architect name and stamps are used.
13. PCATP further stated that infrastructure such as supply water, sewer water and power distribution to be improved and controlled by development authority.
14. One issue PCATP observing is the problem of too many building control authority exist depending on the zone such as SBCA, DHA, SITE. Architects are required to be registered in each zoning if they need to apply the drawings. Registration fee usually need to be paid annually.
15. Power theft is happening in the zone which includes slum area. K-electric tends to provide more load shedding to those theft area. The zones, where tariff payment is high, are receiving less load shedding like few hours per month. PCATP indicated that K-electric is doing good work after privatization.

BCP-EP-2011

16. PCATP representative, former chairman, is listed in the task force member. However, according to PCATP, representative was invited and attended on one meeting only. After that without knowing details, BCP-EP-2011 was notified under SRO.
17. Major issue is that current BCP-EP-2011 states the obligation for PEC registered engineers, consultant and constructor only. Architects are not covered under the BCP-EP-2011 enforcement. In PCATP opinion, PCATP should have been involved as one of the owner of BCP-EP-2011 so that PCATP can regulate architects and town planners.

MEETING MEMO

Date	2 nd September, 2015	Time	14:00 to 16:00
Organization	Association of Builders and Developers (ABAD) Venue: ABAD House Gulistan-e-Johar, Karachi.		
Department			
Attendances	ABAD: Mr. Junaid Ashraf Taloo- Chairman, Mr. Javed Jafri – Secretary General, Mr. Azeem Durani - Admin. Officer, Mr. A. Owais Thanvi – king’s Group JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<p><u>Building Sector Trend</u></p> <ol style="list-style-type: none"> 1. ABAD stated that 600,000 housing are required to be built annually, however only 300,000 are being built in combination of public and private sector effort. As a result, 10.1 million housing are in shortage in Pakistan as of current. 2. To fulfill the gap, ABAD think government of Pakistan need to come up with a policy with strong counter measure such as subsidy. They further stated that there are enough resources available in the market but the barrier is the finance support. 3. Required housing grades are; 60% for Low income group, 20% for Low-Middle income group, 15% for middle income group, 5% for high income group. 4. ABAD had a meeting with government authorities including State Bank and HBFC (House Building Finance Company) recently to discuss improvement of financial support for Low, Low-middle income group. HBFC has agreed to increase the amount financial support to maximum of 70% of construction cost. 5. One of barrier is not enough infrastructure, government and development authority should come up with the policy to improve infrastructure such has road, electricity, sewer system, water supply. 6. As described above strong demand is on residential sector, however commercial sector and industrial sector is also growing. <p><u>Implementation by development authorities</u></p> <ol style="list-style-type: none"> 7. ABAD stated that implementation of development authorities are reasonable. They feel that drawing review is strict enough and inspection during construction is being carried out 3-5 times. Inspector from development authorities checks mainly if construction is according to approved plan, offset-from boundaries. Inspector also checks re-bar, specification of cement. At completion, inspector reviews again all code compliance stated in the regulation. 		

8. JST presented number of application, approved plan and demolition received by SBCA and asked ABAD opinion regarding low ratio of completion certificate and number of demolition. ABAD indicated that it is hard to believe such low ratio of completion certificate. As far as ABAD member concerned, there are so many disadvantages not obtaining completion certificate. For number of demolition goes, they believe that most of those demolition are happening in individual houses who built their house without applying to SBCA.

Energy Efficiency and adoption of BCP-EP-2011

9. ABAD indicated that in general, no insulation and double glazed windows applied on commercial¹ buildings, only few individual house owners decides to include insulation as well as double glazing window.
10. ABAD indicated that as a rough construction cost idea, Rs 1,400/ ft² for apartment and other commercial building, Rs 2,000-3,500/ ft² for individual houses depending on the owner's requirement. Upon comments from JST that high-rise building in Lahore was Rs 5,000, ABAD stated that kind of buildings are high-end market only such as large development with shopping complex.

Architects and Engineers in Pakistan

11. ABAD stated that skill level of architects and engineers in Pakistan is good. They have no issue with them. ABAD further stated that many architects and engineers are working outside of Pakistan.
12. In general, Architects and Engineers holds site meeting twice a month. There is a role called "Supervisor" hired by builder or developer to monitor site activity in daily basis.
13. Most of the technical issues are driven by architects and engineer team, however items related look & feel such as finish and appliance are decided by developer/ individual owner.

Business model of Builder

14. "Builder" means an entity that purchases a land and builds building for commercial purpose. Builder is also purchase building material and contract with Construction Company to build. Construction Company provides service of workers and installation equipment. Only few material are provided by Construction Company such as sand and aggregate. There are some construction companies that do construction entirely, however above stated Builder-Constructor relationship is the majority in Pakistan.
15. Builder appoint architect as one window contact. Architect has its own engineering team such as structure, mechanical and electrical.
16. ABAD indicated that in general, AC are out of scope of builder. House owner purchase AC at their own expense.

¹ "Commercial" includes residential apartment which built for sale.

MEETING MEMO

Date	2 nd Sep, 2015	Time	11:00-12:30
Organization	TOBISHIMA CORPORATION, Karachi Venue: Tobishima corp ,Karachi office		
Department			
Attendances	TOBISHIMA: Mr. Yasuo Kume – Project Manager JST: Mr. Hirooka, Mr. kohno		
Obtained Documents			
Discussed			
<u>現地工法</u>			
1. カラチでは壁はコンクリートブロックが主流。外壁は 150mm 厚、内部雑壁は 100mm 厚を使用する。日本の無償案件において、屋根に断熱材は施工するが、外壁には断熱材は採用されていない。また窓はシングルガラス。			
2. カラチ、イスラマバードはプラントが充実していることもあり、コンクリートブロックが採用されやすいが、ラホールでは近くにブロックメーカーが少なく、運搬費用がかさむ理由で、煉瓦が多く利用されているようだ。			
3. 断熱材は最近ではスタイロフォームが採用されてきている。国内唯一の生産者である DIAMOND JAMBOLON 社製が主流。			
<u>建築確認検査等</u>			
4. イスラマバードでは CDA が現場確認に来るという認識であるが、カラチにおいて最近完成した無償案件、過去案件を含めて現地の建築行政が検査に来た記憶が無い。建築主である学長が確認申請、および検査済み証を必要ないと言っていたとか？			
<u>技術レベル、建設資材</u>			
5. サブコントラクターの技術レベルとしては、無償案件のクオリティを担保するためにはかなり厳しい管理をする必要があるが、十分にそれらを実現させる技術力は保有しているという認識。			
6. 窓の設置は躯体の開口部が完成した後に、現場で枠を切断して設置している。気密性はあまり期待できない。日本でいう住宅用サッシ程度の品質までが限界であり、国内製品では高層ビルの窓に対応できないのではないかと。高品質の窓製品は輸入品に頼る必要がある。			
7. 空調機は品質良いものは輸入に頼る。無償案件ではマレーシア製を利用した。			
8. JST より BCP-EP-2011 において設備配管への断熱材設置が義務付けられている旨説明。それに対して、現地では配管用にはロックウール、グラスウールが使用されているとのこと。断熱材を覆うカバーに良い商品が無いが、見た目を気にしなければ現地に資材は流通しており、技術的にも問題は無い。			
<u>建設コスト、不動産市場動向</u>			
9. 建設コストは高騰を続けており、特にカラチが顕著である。主要 3 都市を比較するとカラチ>イスラマバード>ラホール。最近マンション投資が盛んなようで、国外の裕福なパキスタン人が投資目的に購入しているらしい。彼らは国外での資産保有を好まない傾向があるらしい。また、不動産物件はパキスタン人であることが必要と聞い			

たことがある。

10. マンションブームの参考まで、飛島建設事務所はカラチ ウォーターフロントの高層マンションの1室を事務所としているが、当該地区はセキュリティも良く、人気が高い。278m²で同程度の物件が50-60mil PKR で取引されている。16,700-20,000 PKR/ ft²

MEETING MEMO

Date	3 rd September, 2015	Time	11:00 to 12:30
Organization	ALUMEX-Pakistan Cables Venue: Pakistan Cables Office, Karachi.		
Department			
Attendances	ALUMEX: Mr. Asim Muhammad Khan- Business Unit Head Aluminium Profile Business JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<p><u>Building Sector Trend and awareness of energy efficiency</u></p> <ol style="list-style-type: none"> 1. ALUMEX , as a aluminum profile manufacturer, has been involved in 1) Windows and Doors, 2) Building façade and 3) other aluminium products in the building sector. Their market share is 15-18%. Policy is to guarantee the quality, which results their price being 10% higher than majority of window frame cost in Pakistan. 2. Domestic window manufacturers are growing. Ratio of foreign manufacture’s market share has been reduced to 10% or less now a days. 3. The idea of glass façade was introduced from UAE base developers around 10 years ago. Building that has glass façade is becoming very popular in Pakistan. Such buildings are either corporate office buildings or commercial buildings that targeting high-end user. The client for such buildings are very much aware that energy efficiency of building is important. Almost all glass façade is using double glazing. 4. Majority of builder/ developer are still trying to minimize their investment in construction cost. However, due to the high competition in the market, there are some developers that invest more cost for high quality with high sales price. In construction unit cost, Rs 4,000-5,000/ft² or more is the high-end product. <p><u>Business structure and performance certification</u></p> <ol style="list-style-type: none"> 5. Business structure for aluminnium window system in Pakistan are divided into three parties as described below; <ol style="list-style-type: none"> A) Aluminium Profile Manufacturer: Produce extruded profile B) Glass Manufacturer/ processor: Produce glass slab and process tempering and/or double glazing C) Fabricator: Design window system, study performance, provide required accessories and construct on site. They are single point of contact from architect/ client for window design. Major Fabricator names (Queen Service, ALFA engineer, HITEC Engineer) 6. Manufacturer can obtain certification using appropriate testing procedure for their product such as glass 		

and aluminum profile. However, there is no certification applicable on window as a hall because performance is depends on the work on site. JST stated that Aluminium manufacturer in Japan does fabricators role as well and guarantee the window performance as a hall.

Cost information

7. Approx Cost information;
 - A) Single Glazing Window: Rs 510-520/ ft² (Aluminum Frame Rs 440-450/ ft² , Single Glass: Rs 70/ ft²) Double Glazing Frame: Rs 500-600/ ft²
 - B) Double Glazing Window: Rs 840-940/ ft² (Aluminum Frame Rs 500-600/ ft² , Double Glass: Rs 240/ ft², Tempering Rs 100/ ft²)
8. Construction cost escalation is about 10% per year, Land price escalation observed 50-100% in some area in Karachi. Strong demand has been observed in residential market.

Issues to promote Energy Efficiency of Building

9. There are many substandard product in the market. Building code should indicate minimum performance requirement for product, such as material, finish and performance of weather seal.

MEETING MEMO

Date	4 th September, 2015	Time	17:00 to 17:30
Organization	Kings Group Venue: Avari Tower, Karachi.		
Department			
Attendances	King's Group: Mr. A. Owais Thanvi – king's Group JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<ol style="list-style-type: none"> 1. Kings Group has been in business as builder in Karachi since 1970. Their practice is to buy land, build buildings and sell. Builder purchases building material by themselves and engage contractor who provides labor to build. They also hire architect for their project. 2. In general, Material cost is 70-60% of total construction cost, labor cost is 30-40%, depends on the quality. They make decision on building quality, such as A,B,C grade, based on the area of project. Their target construction unit cost is in general, 1,400 PKR/ sqft. 3. In their practice, land ownership remains under the builder. Building as a hole or floors as strata titled to be purchased. 4. They do not work with bank for fund. He mentioned that application of interest is against Islamic Law. They have many investors for funds raising. So far, their business has been successful. 5. He agrees that Builders are important stakeholder for promotion of energy efficiency in building sector. So far, they are not convinced for initial investment on energy efficiency performance. He stated that to consider energy efficiency, they need 1) economic benefit, 2) government policy, 3) some kind of incentives. 6. JST & Kings Group will meet again on 8th morning for site walk through. Mr. Owais requested JST opinion during site work through if they see any room of improvement. 		

MEETING MEMO

Date	4 th September, 2015	Time	11:00 to 13:30
Organization	Sindh Industrial Trading Estate (Guarantee) Limited Venue: SITE head office, Karachi.		
Department			
Attendances	SITE: Mr. Ahmed Nawaz Jagirani- Managing Director AL-ABBAS FABRICS (PVT) LTD: Mr. Salim Parekh-Executive director, member of SITE Association of Industry JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents	<ul style="list-style-type: none"> ✧ Directory 2008 ✧ Budget 2015-2016 ✧ SITE Karachi map ✧ Outline of Building BYLAW of SITE ltd ✧ Organization Chart ✧ Memorandum and articles of association 		
Discussed			
<u>Issues in Industrial Estate and energy efficiency</u>			
<ol style="list-style-type: none"> 1. SITE and their association member stated that before the promotion of demand side energy efficiency, government should reform the supply side of electricity and GAS. Industrialist are struggling with high energy cost and do not have any funds available to invest for energy efficiency. 2. In Karachi, there is no load shedding in Industrial Estate, however the electricity cost is being expensive due to several loss occurring in distribution system including theft. They further stated that one of the problem is the monopoly by K-electric. 3. Similarly Industrialist could not understand why GAS price has been increased by 25% recently. In general, GAS price should be in proportion with OIL price. Given the fact of recent downtrend of oil price, GAS price shall decline not increase. 			
<u>Regulation</u>			
<ol style="list-style-type: none"> 4. SITE has its own building control authority who regulate development within the SITE boundary. There are three divisions that carry out 1)Factory Check, 2)Buildings & Road, 3) Water supply. 5. SITE has its own Building Bylaws. Industrialist has to submit drawings for review, after approval, construction is allowed to start. During construction, inspector from SITE carry out periodical monitoring and after final inspection approval, completion certificate will be issued. 6. Buildings in SITE is mainly factories and storage. There are few office buildings and low-cost housings for labor. 			
<u>Other</u>			

7. SITE provides land, load, and other infrastructure to industrialist. After handover, SITE provides general maintenance for road and infrastructure outside of industrialist premises.

8. SITE offers their land in reasonable price in comparison with market price to attract industrialist. Examples are indicated below;

A) Karachi land price: Rs 10 mil/acre (Market price Rs 100-150 mil/acre)

B) Sukkur land price: Rs 1.2 mil/acre (Market price Rs 4-10mil/acre)

C) Other area land price: Rs 0.4 mil/acre (Market price Rs 1.5mil/acre)

However, biggest barrier for SITE and industrialist is the too expensive power and Gas supply cost.

9. SITE was established by government of Sindh in 1947 and privatized. In collaboration with the SITE Association of Industry, they are promoting industry in Shindh province.

MEETING MEMO

Date	7 th September, 2015	Time	14:00 to 15:30
Organization	AHR Ali Naqvi Architects (Pvt) Ltd Venue: AHR office		
Department			
Attendances	AHR: Mr. Ali Naqvi, Regional Director Mr. Nasir Qureshi, Project Manager Ms. Sarah Saifi JST: Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<p><u>Introduction</u></p> <ol style="list-style-type: none"> AHR is the British base architects firm with about 50 staffs. Their clients are looking for high-end product with properly controlled design and liability. AHR is proud of their discipline although there is not strict building control regulatory authority in Pakistan. AHR building unit costs are about Rs7,000/ ft² (Commercial, shopping, public used buildings). In case of fully furnished Hotel, includes furniture, unit cost could be Rs 12,000/ ft² <p><u>Building Control</u></p> <ol style="list-style-type: none"> They see that accountability is an issue here in Pakistan. There are so many illegal construction happening. There is no concept of PI (Professional Indemnity) Check points of DA inspector seems to be only PLAN and SET BACKS. Other details (i. e. Structural Details, Safety issues) are hardly pointed out during drawing review as well as site inspection. They understand that either PCATP or PEC registration is required in order to participate to government project. There are so many architects doing business in private sector without above registration. However, Name-lending is an issue here in Pakistan. It is called BRIEF CASE ARCHITECT. In comparison with Development Authority, DHA building control is relatively strict. What they see is that FILING is important for DA. The actual construction on site is not strictly controlled. Another issue is the corruption. <p><u>EE&C of Building</u></p> <ol style="list-style-type: none"> Most of their project uses double glass, often triple, with insulated roofs. This is just used as international standard. Awareness and education are essential. Roof insulation has been recognized as effective material to prevent heat gain. However, awareness of heat loss thorough other walls are not yet well recognized. AHR noted that about 25% of construction activities in Pakistan are happening in Karachi. Out of 200mil population, 2 mil people are capable to adopt energy efficiency material and equipment in their building. 		

MEETING MEMO

Date	8 th September, 2015	Time	10:00 to 11:30
Organization	Defense Housing Authority, Karachi Venue: DHA Karachi office.		
Department			
Attendances	DHA: Mr. Mr. Saiyid Hasan Raza Hussain, Senior Project Director & Chief Engineer JST: Ms Sasabe, Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed			
<u>Introduction of DHA</u>			
<ol style="list-style-type: none"> 1. DHA is a non-profit organization that develop land, with road, water, electricity and sewer system and sell to member of DHA. Originally established in order to provide houses for soldiers, however DHA area becoming popular for other civilian. 2. CE indicated that the reason of DHA being popular are 1) High security and 2) Discipline. 3. When DHA develop lands there is always hard negotiation with energy supply companies, electricity & Gas. Those monopoly company has its own regulation and specification. Whenever DHA propose new product or specification for their infrastructure development, there will be a conflict. Eventual, DHA has to obey instruction from those companies. 4. Basically DHA only supply developed land only. However They have done buildings by themselves. One of the experimental project in phase 8, near DHA golf club was now became so popular due to high security. 5. DHA owns and operate several schools. Originally schools are build in DHA due to the remote location from city center. Now they have 35 DHA schools in Pakistan includes 2 public universities and 2 private universities. 6. DHA standard land sizes: A) 2,000 yd², B) 1,000 yd² / high-end, C) 500 yd² / high-middle, D) 300 yd² / middle, E) 120 yd² /low. 			
<u>Regulation in DHA area</u>			
<ol style="list-style-type: none"> 7. DHA identifies zoning for the building usage. 1) Residential , 2) Commercial, 3)Special build area (30 story). Each zoning has regulation of FAR (Floor Area Ration) and setback regulation to control living environment. There is DHA Karachi building Bylaw that regulates building in DHA zoning. 8. DHA inspection division is in charge to watch construction activity. At least three stage of approval to be obtained. 1)Plan approval, 2) Foundation stage, 3)Completion stage. 9. CBC (Cantonment Board Clifton) has its own regulation. 			

10. Large development in DHA area: Crescent Bay, developed by Emaar Giga, was a open bid for developers. When DHA contracts with developer, DHA has authorization to add conditions to control building environment.

EE&C in Building sector

11. The barrier for improvement of EE&C for building sector: 1) Wealthy people that do not care about high electricity bill, losing opportunity of energy conservation in their building. 2) Architects and Engineers do not propose EE&C due to lack of knowledge.
12. DHA drafted PLANNING GUIDE LINE which regulate sustainable façade for commercial areas, including usage of insulation as well as double glazed windows. However, this is still in discussion internally.
13. DHA has its own program for capacity development. They have work shop such as (Energy Saving, Water Saving, Re-use of water, Solar energy, Solar Gyzer)

Real Estate Market

14. The land of 500 yd² costs PKR 500,000 when DHA sell to public. However, some sized land in Karachi has escalated to PKR 35 mil.
15. In DHA phase 8, one apartment (4Bedrooms) price was PKR 6 mil when DHA sold, however same apartment is PKR 35mil in real estate market now.
16. Residential building demand is strong. Average construction cost is PKR 3,000/ ft², in high-end product, PKR 3,500-4,000/ ft²

MEETING MEMO

Date	8 th September, 2015	Time	14:00 to 17:30
Organization	Kings Group Venue: Construction Sites & Sales Offices of Kings Group projects.		
Department			
Attendances	King's Group: Mr. A. Owais Thanvi Mr. Ahmed Mustafa Thanvi JST: Ms Sasabe, Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents	Sales brochure		
Discussed			
<u>Construction Site 1</u>			
<ol style="list-style-type: none"> 1. Site Area 6,000 yd² 2. 3 Apartment Towers (10F+G, 14F+G, 18F+G) with basement parking floor. 3. Total 185 apartments (3Bedrooms(shower to each BR) 1650 ft²) with 210 car parking space. 4. Construction Period Dec 2013-Dec 2016. 5. Construction Cost PKR1,400-1,500/ ft² (For material) +PKR450/ ft² (For labor) (No Air conditioner, No Kitchen equipment, No Water Heater) In total PKR 1850-1950/ ft² 6. Typical floor height 10'-5" 7. Seismic Zoning Category 3 8. Concrete Strength(4750PSI for column(32mpa), 3750PSI for others(25mpa)) 9. Rebar: 6000kg/ apartment, 24,000kg/ floor 10. Solid 4 inch concrete block in strength of 800PSI (5MPA). 6inch block used only for electrical panel installation purpose. 11. Sales Price in this area is approx PKR10mil/apartment. If it is Clifton Area, same size apartment sales price will be 20mil with construction unit cost of PKR 2,500-3,000 ft². Building grade depends on the price of land. 12. Land ownership remains under builder. Builder to sell the strata titled building portion to buyer. 13. Payment scheme is 3 year installment as standard which equals to construction period. In this project, 70% of apartments are reserved at construction start. As of current, 95% of apartments have been sold. 			
<u>Construction Site 2</u>			
<ol style="list-style-type: none"> 14. Construction Started June 2015, currently under construction of raft slab foundation. In Karachi, pile is hardly required due to the good geotechnical condition. This project has been booked for 70%. 			

Construction Site 3 (Palm Residences)

15. 15storey building (11 residences, 2 parking levels, 1 tenant spaces at ground level)
16. Site Area 2,000 yd², 7,200 ft²/floor
17. Construction cost PKR 1,500-1,600
18. 1,900 ft²/apartment
19. Parking number is about 100-120% of number of apartment. This is according to SBCA regulation.

Existing Apartment

20. Old amenity space has been retrofitted into studio. 2mil for sales with 450-500ft²
21. Water tank was installed by tenant at their expense. When supply water is in shortage, tenant may use them.

Construction Site 4 (Kings Classic)

22. 7 Blocks of apartment with 4 storey building. (Due to zoning regulation)
23. 16 apartment/ building. 4 apartment/floor x 4 levels. Ground floor is for parking space.
24. 8,000 ft²/ floor.
25. Sales price 5 mil/ apartment with 3 bedrooms. (Building unit cost 1,300PKR)
26. 70-80% apartment are booked. 4 Buildings are under construction.

Interview with financial manager at sales office

27. No double glazing is used in Bangalore.
28. 22-25% buyer seems to be expatriates working outside of Pakistan. Their purposes are 1) financial stock, 2) Saving for funeral and marriage for family, 3) Future apartment for his/hers own use.
29. In local market, majority are 1) investors, 2) end user who owns business in Pakistan or a group of people who earns PKR 200,000/ month or more.
30. King's Group is keen to establish their brand image. Once brand name is recognized as reputable, customer often purchase the product without going through the details.
31. In multiple story apartment in general, customer prefer to pick first floor apartment due to the risk of electricity problem which may cause problem to elevator. However, in Clifton area where no worry of electricity issue, higher level apartments are popular because of the good view.
32. In king's project, customer is expecting reasonable sales price rather than high energy efficiency performance. Current standard specification is single glazed window with non insulated walls & roofs.

Construction Site 5 (Kings Cottage)

33. 1,300 ft²/ apartment. (3Bedrooms) in 30,000 yd² land.
34. Target buyer is PKR150,000-200,000/month as family income. Sales price of PKR 4.5-7.5 mils. This income group seems to be 20-30% of Karachi population.

Maintenance and Market Trend

35. After the building handover, Kings will be involved in maintenance contract with customer. Maintenance fee is depending on the service to provide, however in average, PKR 3,500/month is the standard service, which includes periodical maintenance of external walls and re-painting.
36. Kings understand that keeping building in good shape will add value to the product for sales. Owners understand this policy.
37. Kings indicated that current apartment sales price ranges PKR 5-10 mil. At luxury product at maximum 20 mil in Karachi general. However, at Clifton area, high-end products are price range of PKR 40-50 mil which driven by foreign base developers such as Emaar Giga.

MEETING MEMO

Date	9 th September, 2015	Time	10:30 to 12:00
Organization	Emaar Giga Karachi Limited Venue: Emaar Sales Center.		
Department			
Attendances	Emaar: Mr. Syed Khalid Riaz, Director Project & Development JST: Ms Sasabe, Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed			
<u>Introduction</u>			
<ol style="list-style-type: none">1. Emaar Giga Karachi has started development at the south east edge of DHA phase 8 which called crescent bay. It is consist of 3 bays (2 residential zones with one comital zone.) Currently 6 buildings are under construction. Emaar has been doing their business in 17 country and 35 cities.2. As stated in the meeting held in Islamabad, Emaar is following international standard which is automatically complies local building regulations. Construction cost as well as sales price information are not available due to the confidentiality.			
<u>EE&C for building sector</u>			
<ol style="list-style-type: none">3. Emaar indicated that there are many energy efficient building material/ equipment available in neighboring countries. However, due to the custom duty and transportation cost, those product does not make economic sense as of current. Emaar suggested that if government of Pakistan is serious about promotion of EE&C of building sector, some incentive scheme for good building material will provide strong driver into the market. UAE has such incentive scheme.4. To promote EE&C, they think two policy is required. 1) Strict Building Regulation, including strict site inspection. 2) Incentive scheme for both building owner and material/ equipment manufacturer.5. Emaar also stated that trade-off idea, such as bonus Floor Area Ratio, will work as incentive to developers. There is no such trade-off system in Pakistan.6. Although the no incentives in Pakistan, Emaar project is using Low-E double glazing windows with Insulated external envelope. This is just because of their client expectation as standard specification. Their project also includes solar panels.7. Internationally recognized corporation, such as Coca Cola, willing to obtain certificate like LEED for their social status as well as actual economic benefit. However, due to the high cost requirement for LEED, many owner eventually decides not to apply LEED. It will be nice if GoP establish some kind of certificate which makes economical sense.			
<u>Energy issues</u>			

8. Emaar has been trying to establish power generation by themselves. However, it has been unsuccessful due to the rejection by NEPRA. They understand that the government policy for power generation is changing. So Emaar will continue to study power generation/ co-generation for their development area.
9. 70% of generator is using GAS as a fuel. Gas supply in Pakistan is problematic.
10. Used water will be used for irrigation.
11. Solar panel will be useful in horizontal development due to the area requirement.
12. Hydro-Power generation is effective in Pakistan. Payback period seems to be 7-8 years.

Market trend

13. High-end apartment in Clifton and DHA area is about PKR17-20 mil. Those who are capable to purchase High-end apartment are approx 1-1.5% of population.
14. In general, high-end residential building is costing PKR 6,000-7,000/ft². (inclusive AC, kitchen equipment and all built-in cabinet/ equipment.) Office building is costing PKR4,500-5,500/ft².
15. The customer of Emaar is middle-high to high income group of citizen and expatriates of Pakistani. Standard payment term is 3 years installment payment.
16. Their apartment product is mixture of 1BR/2BR/3BR/4BR. Depending on the demand, ratio of apartment size various. In Clifton and DHA area, penthouse apartment is most luxury grade because of its view to the ocean.

Facility Maintenance

17. Emaar provides facility management service to resident. It costs PKR5,000-20,000/month depending on the scope of work. The minimum service includes general maintenance for public area such as elevator, if customer requires, Emaar can provide maintenance service for private area as well.
18. Emaar is keen on controlling design environment. That is one of the reason that AC is included in building scope to avoid chaotic installation of condenser in external wall. For re-placement of those AC after handover, Emaar facility management service will control the design. This effort will reduce energy load as a whole of building by choosing energy efficient product .

MEETING MEMO

Date	9 th September, 2015	Time	14:00 to 15:30
Organization	Ahed Associates Venue: Ahed Associates office		
Department			
Attendances	Ahed Associates: Mr. Ejaz Ahed, Managing Architect Mr. Saifullah Sami, Principal Architect Mr. Khalid Hasan, Principal Engineer M.G. Engineering Associates: Mr. Muneer S. Godil, Principal Engineer JST: Ms Sasabe, Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents	Ahed Associates Firm Profile Architecture+Interior-42-2015-Reshaping Educational Spaces DVD : Presentation & co-gen system		
Discussed			
<u>Introduction</u>			
<ol style="list-style-type: none"> 1. Ahed Associates (hereafter AA) are founded in 1964, offers professional services in the fields of architecture, engineering, planning, interior design and project management. All architectural and interior design services are provided in-house. Structural design, plumbing, HVAC and firefighting services are provided by their consultant, but coordinated in-house. 2. Habib University campus at Karchi, designed by AA, received a “Design Excellence Award”(SCUP Award 2010) at concept design stage. The building design is reflecting climate and orientation. All design elements are in consideration of heat gain from sun. Air-conditioned area are minimized and most of circulation spaces are non-conditioned. Those circulation spaces are covered by architectural elements which create shade and natural. Building envelopes are designed with insulated wall/ roof and double glazing. Solar panels are installed on roof top. 			
<u>EE&C for building design</u>			
<ol style="list-style-type: none"> 3. EE&C for building are consists of two major aspect. 1) Building and Shell, 2) Mechanical/Electrical. Architects are responsible envelope design to minimize heat load and Mechanical/Electrical engineer is responsible for energy efficiency. 4. Key aspects on passive design is 1) Wall, 2)Roof, 3) Orientation. Their standard wall section is 6inch external wall with cavity and 4 inch internal wall. Insulation may be installed upon client request. For roof, 2inch insulation is the standard. There are insulated roof tile available in Pakistan which certified by PSCIR for performance. 5. When AA present mechanical design option to client, they prepare presentation to compare several options with initial cost and life cycle cost. Co-generation is applicable in Pakistan. It has been many cases in the country. AA shared with JST for one sample presentation for co-gen options. MEP engineer 			

used software, produced by USA, for such study.

6. The idea of co-generation is not common in Pakistan, however especially for industrialist, client understands the benefit. As far as AA concerned, there are more than 100 co-generation system exists in Pakistan. Absorption cooling system is available.
7. GAS turbine cooling system is also available in Pakistan. However, stability of GAS supply is in question in Pakistan. LPG is the alternative option.
8. Not only stability of GAS supply, Stability of electrical supply, water supply are also in question in Karachi. Solar panel cost is becoming reasonable.
9. A few client understands the benefit of Building Management System and it has been built in Pakistan.
10. The heating during winter to be considered in Islamabad & Lahore. (Not for Karachi)

Market Trend

12. If client is the building user, they tends to see the benefit of EE&C effort in building design. However, most of developer does not see the benefit of savings in running cost. After handover, there are many apartment which does not have home association board or maintenance system.
13. Clients of Hospital and university projects are very much keen on lifecycle cost where many advanced EE&C technologies have been adopted.
14. The building image from Dubai & Singapore are popular which is full of glass façade.

MEETING MEMO

Date	10 th September, 2015	Time	9:45to 11:30
Organization	Pakistan Engineering Council Venue: PEC office		
Department			
Attendances	PEC: Engr. Dr. Nasir Mahmood Khan, Head/ Additional Registrar Engr. Ghulam Karim, Deputy Registrar Mr. Faiz ul Sibtain, Project Coordinator/Junior Executive JST: Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed			
<u>JST presentation</u>			
1. JST presented summary of findings including answers to questionnaire to development authority. JST reported that both BCP-EP-2011 & BCP-SP-2007 have not been adopted into development authorities. JST also presented software that supports EE&C building design by comparing initial cost and running cost.			
<u>Implementation of BCP</u>			
2. PEC stated that implementation of BCP-EP-2011 is not PEC responsibility. PEC is mainly taking care of issuance of technical regulation/ guideline, registration and human resource development.			
3. Upon clarification by JST, PEC stated that owner of Building Code Pakistan 1986 is MOHW, however BCP-1986 is not mandatory regulation.			
4. MOHW has proposed the idea of making non-compliance of Building Code as criminal offense. They will further discuss with relevant authority.			
5. PEC indicated that in order to adopt BCP-EP-2011 into public works, Federal Government shall write a letter to Department of Planning and Development for federal government work and write letter to secretary body of provincial governments for provincial public works.			
6. PEC mentioned few suggestions as a roadmap how the implementing agencies/organizations can adopt and implement these provisions/code into their practice through devising a combined strategy in a day workshop initiated by MOHW or Planning Commission or by PEC as a statutory body for entire engineering profession in the country , enabling all stakeholders to work in an agreed strategy/road map after analyzing and identifying the Gaps and solutions at various levels.			
<u>Other Provision, Revision / Procedure of BCP</u>			
7. Notified Provision under the BCP-1986 are 1) Seismic Provision and 2) Energy provision only. PEC indicated that they are working on 3) Pakistan Electric and Telecommunication Safety Code, 4) Building Code of Pakistan Fire Safety Provisions.			

8. PEC has been authorized to notify the bye-law or regulation by issuance of S. R.O. under PEC act 1975. (Section 25 Bye-laws of the council, Section 25A Power to make regulations.)

Registration requirements

9. Upon JST's clarification, PEC stated that any architects firm who wish to carry out their practice in Pakistan shall register under PEC registration.

Software and Handbook

10. PEC indicated that proposed software by JST has a potential to be used as supplementary handbook or manual for grass roots level activity. JST stated that software can be converted to Pakistan characteristics as well as other type of buildings.

MEETING MEMO

Date	10 th September, 2015	Time	12:30 to 14:30
Organization	ENERCON Venue: Ministry of Water and Power conference room		
Department			
Attendances	ENERCON: Mr. Hassan Nasir Jamy - Managing Director. (additional secretary of MOWP) Mr. Asad Mahmood, Technical Manager. University of Engineering & Technology, Peshawar: Mr. Syed Imtiaz H. Gilani (VC & Convener Task Force of BCP-EP-2011) JST: Ms Sasabe Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<p><u>JST presentation</u></p> <ol style="list-style-type: none"> JST presented summary of findings including answers to questionnaire to development authority. JST reported that both BCP-EP-2011 & BCP-SP-2007 have not been adopted into development authorities. JST also presented software that supports EE&C building design by comparing initial cost and running cost. JST also prepared Matrix showing required action, purpose, barriers and expected time, achievement for improvement of implementation of BCP-EP-2011 and revision for it. JST & Enercon gone through item by items. <p><u>Discussion for improvement of EE&C</u></p> <ol style="list-style-type: none"> MD stated that once BILL is enacted, Provincial Governments shall also be entitled to facilitate and enforce regulations as necessary. MD indicated that awareness campaign carried out in New Zealand was very successful. He is considering to adopt some ideas into campaign in Pakistan. Presented software has a potential. ENERCON may incorporate software adoption into their RFP of consultancy service for handbook of BCP-EP-2011. Mr.Syed promised to recommend three to five of taskforce members of BCP-EP-2011 to deal with the handbook to Mr.Asad so that the small team can arrange meeting easily and make the handbook in an efficient manner. Besides the taskforce members, Mr.Asad noted he will make a public notice for a recruitment of consultants for the handbook. He said he will ask for advice on the TOR of the consultants to Mr.Hirooka. JST further stated that in order to adopt to Pakistan, detailed climate data and construction cost information will be required. Current software has been designed for office building, but it is possible to adjust for other type of building. ENERCON is seeking roadmap plan for next two-three years. Whatever the measures to be taken, sustainability is important. Availability of expert is key issue in Pakistan and MD is interested in inviting experts through donors technical assistance support to be available in ENERCON office. MD 		

mentioned that local people tend to listen with more attention what foreign experts say.

7. Monitoring system requires cooperation from provincial government, development authorities, TMAs and from private sector. With the increase in the number of participants, more would be the level of effort required.
8. World bank has done research called BISP (Benazir Income Support program) and got data from 27 mil household. JST will follow up for available data.
9. Mr. Syed stated it would be a good idea to add the contents of BCP-EP-2011 in curriculums of architectural courses. He also suggested giving official certificate to engineers who have capacity to implement BCP-EP-2011.

MEETING MEMO

Date	11 th September, 2015	Time	12:30 to 13:30
Organization	ENERCON Venue: JICA office		
Department			
Attendances	ENERCON: Mr. Asad Mahmood, Technical Manager. The World Bank: Mr. Gul Najam Jamy JST: Ms Sasabe Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<ol style="list-style-type: none"> 1. JST shared wrap-up meeting material with Mr. Gul Najam Jamy who was involved in the creation of Building Energy Code 1990 and handbook. 2. Mr. Jamy indicated that the important point for EE&C promotion is to identify which entity is holding key role of improvement. It is also important to involve and utilize existing organization for activities. 3. He stated that CDA has division where structural design vetting is carried out. In similar way, CDA should be able to establish the division for BCP-EP-2011 vetting to be carried out. 4. He also stated that introduction of user friendly software is essential which could be downloaded from website. Almost all building design professionals have their own computer systems with latest softwares having access to internet as well. He thinks adopting BCP-EP-2011 into government projects should be possible without major barrier. However, promotion in private sector requires strong action. He suggested that all development authorities should have division for the EE&C and a dedication section focusing on EE be added in their respective websites. Upcoming Young generation of professionals is more familiar to web environment than current generation of professionals. 5. PCATP, IAP, PEC, ENERCON should come up with more program of tutorial and seminar for EE&C for building. 6. He thinks that Punjab including Lahore has more demand of EE&C for building due to the severe climate. (No wind in Summer.) Karachi has better environment compare to Lahore. 7. One of the issue he saw in double glazing is that due to the substandard quality, humidity gets in between the glasses. He also stated that condensation is observed in Islamabad. Minimum standard for window product shall be established. 8. Incentive scheme along with consumers awareness is very essential to promote efficient building construction. He thinks the penalty is difficult. It may create serious resistance from public. He believes that incentive scheme has more potential and will lead to better results. 9. For example, identify Islamabad as model city. Work with CDA as counterpart and establish 		

implementation body for EE&C. Also work with MOHW/ Public works division to maintain existing buildings as well as new construction under EE&C policy/legislation. It is also essential to involve universities for promotion. University will be able to provide students for necessary activities.

10. For Private sector, commercial sector will require to show solutions to their problem. For residential projects, financial incentive will work well.
11. Upon JST's clarification about insulated wall section indicated in handbook of BEC-1990. He stated that people are nervous about humidity and fungus in cavity walls. The method without cavity wall may have better potential to be adopted. Available insulation materials are foam insulation as well as spray insulation.

MEETING MEMO

Date	11 th September, 2015	Time	16:00 to 17:00
Organization	KfW Venue: KfW office		
Department			
Attendances	KfW: Dr. Parvaiz Naim. JST: Ms Sasabe Mr. Narafu, Mr Oka, Mr. Hirooka, Mr. Kohno		
Obtained Documents			
Discussed	<ol style="list-style-type: none"> 1. KfW has been approached by WAPDA for the retrofit of WAPDA building in Lahore which is existing office building with 2000 officers capacity, located at center of Lahore. Once WAPDA retrofit completes in Lahore, they may continue the project in WAPDA building retrofit in other cities. (GIZ is working with Punjab government and will carry out audit. This project will be carried out by Punjab government by their own funds). 2. KfW has provided a Euro 6m Grant to WAPDA for establishing Pakistan Glacier Monitoring Network. This Project includes the construction of two new buildings in Lahore and Skardu for receiving signals from glacier monitoring equipment. Those buildings will be designed as “Showcase” of EE&C technologies. 3. The third project of KfW is big. The idea is to access Green Climate Fund for improving energy efficiency of the existing government buildings. KfW has requested the Ministry of Climate Change to collect current energy use information for the target government building. After analysis of current situation, improvement measure and construction to be carried out. KfW is interested in working with major international donors including JICA. 4. JST responded that current survey is “Data Collection Survey” for following activities. The activity for next few years have not been identified, however there might be a kind of “technical support” depending on the policy action set under Energy Sector Reform. 5. KfW indicated that government buildings covers 10% of the entire buildings in Islamabad. It will have certain impact to building sector. If all government buildings have solar panel on the roof and premises and connected to existing grid for public usage, the surplus amount of electricity could be fed into the grid for reducing electricity shortage. 6. KfW asked if JICA intended to revise BCP-EP-2011. The reason was that KfW intended to encourage private sector to follow BCP-EP-2011 after completion of government building retrofit. He was worried that the government institutions themselves may resist if BCP-EP-2011 became stricter. JST responded that current idea is to improve implementation before revision of BCP-EP-2011. 		

MEETING MEMO

Date	8 th December, 2015	Time	11:00 a.m to 2:30 p.m
Organization	ENERCON Venue: ENERCON Building G-/5 Islamabad.		
Department			
Attendances	ENERCON: Mr. Asad Mehmood, Manager Technical ECF. PEC: Engr. Faiz ul Sibtain. (Absent in JST presentation and discussion) MoHW: Mr. Muhammad Irfan, Director General PHA, Islamabad. (Absent in JST presentation and discussion) Task Force Members: <ol style="list-style-type: none"> i. Dr. Muzaffar Mahmood, Dean Academics, PAF-Karachi Institute of Economics & Technology. ii. Mr. Farhan A. Mehboob from S. Mehboob & Company (Consulting Engineers), Karachi. iii. Eng. Faiz M. Bhutta, Director Projects of Sustainable Energy services International. iv. Mr. Ejaz Ahmed Qadri, MPCATP from Qadri Associates, Islamabad. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	----		
Discussed	<p><u>Introduction and preliminary discussion.</u></p> <p>Dr. Muzaffar Mahmood at the outset started the meeting and introduced that Mr. Farhan Mehboob is the first person who took initiative of formulation of Building Code of Pakistan (Energy Provision-2011) hereinafter referred to BCP-EP-2011 in the year 2011 although building codes 1990 were already existing only in the shape of book. Formulation of BCP-EP-2011 was initiated formally by Pakistan Engineering Council (PEC) and constituted Task Force Committee which went for technical aspect of these codes. Finally PEC prepared and notified BCP-EP-2011 but now it is at the behest of ENERCON for its implementation in accordance with the provisions being executing agency. He briefly highlighted the issue of energy crises and stated that it is not new issue rather it goes back to the year 1967 when it actually emerged in Pakistan. On the other hand, Mr. Asad informed that Managing Director of ENERCON and Convener of this meeting Mr. Mumtaz was not able to participate in this meeting due to other urgent commitments.</p> <p>A formal presentation highlighting the current energy scenario and its solution along with proposal of action plan was accordingly delivered by JST and participants of the meeting provided their input.</p> <p><u>Incentive Schemes</u></p> <p>Participants stated that manufacturers of various products are essential to be provided incentives. For example, few companies are producing fans at 150 W while some other companies are producing only 50 W fans, therefore, whosoever is producing energy efficient fans, deserve to be awarded incentives that may be tax exemption or tax reduction for a certain time period.</p> <p><u>Mr. Ejaz's view point:</u></p> <p>Issue of certification facility: Mr. Ejaz succinctly stated that Pakistan does not have certification facility, so</p>		

certified Auditors come from UAE or some other countries. He further stated that 5 years time period for implementation of BCP-EP-2011 as mentioned in the presentation seems enough to attain target if Government of Pakistan seriously takes it.

Design in view of climate zones: He further stated that we need to make intelligent design of the buildings purely keeping in view the climate zone. For example, in Islamabad Government designed Metro-Bus service without making sure of climate zone. On the other hand, some old buildings i.e. State Bank of Pakistan and NARC's building were constructed keeping in view of the climate zone.

Mr. Farhan Mehboob's view point:

Payback period: Mr. Farhan stated that payback period is less than that mentioned in presentation because at this stage Pakistan is also facing gas and electricity load shedding, therefore, generators spend more money for provision of electricity. Most of the generators have been installed in the commercial/public sector buildings which are running on diesel. He stated that actual running cost is 2-2.5 time more than the electricity cost based on the electric tariff due to the frequent usage of backup generator.

Consultants and Human resource: There are thousands of consultants designing the buildings but out of them few are familiar with the BCP-EP-2011. Reason is human resource. Most of the people should be trained for designing the buildings in accordance with the BCP-EP-2011 for its implementation. In UAE, for example, building codes and energy efficiency code grew slowly and gradually. (i.e. without complex calculation, first step was to provide insulation on wall, second step was to install double glazing windows, etc) In Pakistan stakeholders need simple system. Only 200 people who can design building in accordance with the provisions but again no authority has yet been established to monitor such activities. He further put example of Clinton climate initiative taken by Karachi before 11 years but that also failed because of lack of taking care of it.

Capacity Development: He stated that for the training of the professionals, the existing tutorial platform by IAP, PEC and PCATP shall be utilized.

Energy efficient buildings: He stated that in Karachi two buildings were decided by government to be built as energy efficient. Preliminary people conducted survey and they designed the building in accordance with the ASHRAE standards, eventually it was noticed that constructed building is not saving energy rather using more energy due to the poor construction quality.

Calculation method: He very much agreed on the proposal of JST for calculation method. He stated that we also need simple spread sheet for calculation method as proposed by JST and UAE is also following the same pattern.

Market barriers: He stated that if anyone intends to construct sophisticated building, material is not available in local market and imported materials are too expensive, therefore, he recommended that government should apply macroeconomic policies.

Incentives for retrofitting: He suggested that government should take initiative to provide some incentives to the owner of the buildings for retrofitting of existing buildings. For example, some kind of certification by energy authority, may have impact to public mind set.

Existing Government Buildings: He suggested that before making any actual plan on existing government building retrofit, proper survey to be carried out in order to measure the current performance. He is under impression that existing government buildings are not consuming a lot of energy as compare to private sector. The rooms are dark due to the minimum lighting, hot in summer and cold in winter due to insufficient AC capacity.

Eng. Faiz Bhutta's view point:

Target building of BCP-EP-2011: He stated that he was leading the Sub-Committee of Task Force on Lighting and Electrical Power System when BCP-EP-2011 was framed. When they were framing applicable building for BCP-EP-2011, they decided that BCP-EP-2011 should not be stringent rather it should be easily applicable and there should not be resistance for its implementation. Further stated that when they started from 500KW load but after doing research we came to know that Pakistan has more consumption share of domestic than industry and Wapda gave us proposal to put limit of 25 KW which was too small and all experts decided to put limit of 100KW and with limit of conditioned and non-conditioned areas to cover warehouses

Mr. Asad's views point:

Future plan of EERCON: He appreciated the presentation delivered by JST. Further stated that presently ENERCON is working on other projects as well that includes KfW Green buildings, UNIDO public buildings energy audits and UN-Habitat to develop demo houses according to climate zones.

For enforcement of BCP-EP-2011: Further stated that every development authority in Pakistan has its own board of directors. In the previous meeting held in HUD&PHED office Lahore, all development authorities present in the meeting assured to take BCP-EP-2011 to their respective board of directors for incorporating it in their bylaws in true letter and spirit.

Relationship between previous provision and BCP-EP-2011: He further stated that Building Code of Pakistan 1986 is considered as an integral part of BCP-EP-2011.

Mr. Faiz ul Sibtain point of view:

He informed the house that USAID Power Distribution Program has already done lot of work on energy efficiency, management and also prepared compliance handbooks for directly exposed workforce of power sector. In this regard Engr Muhammad Saleem Arif Deputy Chief of Party USAID, Pakistan might be approached for obtaining updated resource material.

Answers to JST questionnaire:

1 Availability of BCP-1986: Mr. Asad will confirm.

2 Enforcement of BCP-EP-2011: No objection against JST understanding.

3 Role of Task force member: Responsibility were not divided in chapters. Group of people were involved in respective chapter based on their profession. However, Mr Farhan Mehboob was taking initiative on mechanical design portion as well as entire chapter. Mr. Eng. Faiz M. Bhutta took lead of electrical design portion.

4 Reason for Recommended Guideline: The first edition intended to be easy to adopt.

5 Reason behind the scale of applicable building: The first edition intended to be easy to adopt.

6 Calculation Method: Total of all material thermal performance with its thickness.

7 Climate Zoning: The first edition intended to be easy to adopt.

MEETING MEMO

Date	9 th December, 2015	Time	4:30 p.m to 5:30 p.m
Organization	UN-HABITAT Venue: Serena Business Complex, Islamabad.		
Department			
Attendances	UN-HABITAT: <ul style="list-style-type: none"> i. Ms. Sumera Izhar, Shelter and Protection Specialist ii. Mr. Ghulam Abbas, Senior Project Associate. iii. Kashif Iqbal, Quality Assurance Officer ENERCON: Mr. Asad Mehmood, Manager Technical ECF. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Geospatial mapping of Pakistan, Energy Efficient Housing, Improvement of Thermal Performance of RC Slab Roofs, Maps of Pakistan with extreme hot and cold temperatures.		
Discussed			
<p><u>Introduction and preliminary discussion.</u></p> <p>At the very outset, JICA Survey Team introduced and explained the objective of this survey and energy efficiency activities in Pakistan. JST also discussed the current situation of Pakistan regarding energy efficiency and conservation in the building sector of Pakistan.</p> <p><u>Last Project of roof insulation in Islamabad by UN-Habitat 2010</u></p> <p>Ms. Sumera stated that UN-Habitat designed a project of roof insulation on higher scales to be executed in all four provinces of Pakistan, but initially it was done on small scale only in Islamabad due to limited funds available. In this project, roof insulation in the existing government residential accommodations occupied by low paid employees of Federal government in Sector G-6 in Islamabad was retrofitted. Roof insulation was retrofitted while testing 19 different products including indigenes materials for testing and found best five options. Answering the question from JST about impact after the project, UN-Habitat stated that although they monitored the pilot project to compile the results at least one month but did not do formal evaluation of the project due to insufficient funds.</p> <p>Results of the Project:</p> <p>She stated after completion of this project they did not do formal evaluation due to limited funds but some people started adopting roof insulation in the neighborhood and by those who had been made aware of the results during the implementation. She further stated that part of the study objective was to actually campaign to change mind of the people towards energy efficient buildings/houses.</p> <p>In low income government quarters, most of people do not have AC, however selected roof insulation improved the living environment even with fans.</p> <p>Barriers:</p> <p>While applying roof insulation, it was observed that houses selected for roof insulation were old ones, therefore, people were very much afraid of its damage because most of people used to say that if UN-Habitat puts roof insulation, roofs will fall down. Further stated initially UN-Habitat took few months to talk and convince the Government to allow them carry out this project then again they spent much time to talking the people because residents were very much curious and afraid of roof insulation because of old houses.</p> <p>She further stated the biggest impediment is to mobilize the communities for conservation of energy in Pakistan. Social mobility is utmost required because people are not familiar with energy efficiency.</p> <p><u>New Project – in preparation</u></p>			

UN-Habitat is planning project to carry out similar method as 2010 project in other four provinces where represents particular climate character in Pakistan. The best five options from last project will be selected for testing, in this time, they may include testing wall insulation as well as double glazed windows.

Proposal Action of JICA Survey Team

She stated it seems difficult that Government would provide incentives of tax exemption or tax reduction to the people, manufacturers, constructors etc rather Government of Pakistan always tries to impose more taxes instead of rebate. She proposed that incentives need to be bit different neither tax exemption nor reduction. For example, UN-Habitat did roof insulation project in Islamabad, the same can be applied in other cities, free of cost work on the selected houses for the first time and later house-owner maintenance, or there could be coordination with government line departments for reduction of electricity tariffs of households to facilitate them, and in case of government employees schemes, the government departments can be mobilized to reduce amount of maintenance funds deduction from the employees' base salary This could be incentive to the people in true sense to flourish energy efficiency and conservation idea. In Pakistan literacy rate is very low, hence people required to be educated through different awareness campaigns and also campaign of incentives.

Geospatial Mapping Project

She stated that after the flood of 2010 in Pakistan, the district administration buildings in the severely affected districts also received damages, UN-Habitat conducted a study of these buildings to assess the structural vulnerability. An Atlas titled Geospatial mapping and preliminary survey of critical government buildings in most vulnerable districts of Pakistan has prepared. An original copy of Atlas has been provided to JICA Study Team.

Other projects in vulnerable areas

UN-Habitat has been working on flood affected areas to improve the buildings affected by natural disaster in the northern areas of Pakistan. After the 2010 flood, a number of houses were destructed due to disaster because most of the houses were built by traditional means and by using stones. UN-Habitat made efforts to educate people how to do stone construction in disaster resilient and safer manner and how to improve it with best methods. UN-Habitat also advocated the government on this issue.

BCP-EP-2011

Ms. Sumera stated that UN-Habitat is advisor for revision of BCP and inclusion of seismic provision but it was not involved in formulating in Energy Provision in Building Code of Pakistan initially.

MEETING MEMO

Date	11 th December, 2015	Time	11:30 a.m to 12:30 p.m
Organization	CDA Revenue Department Venue: Revenue Department, Iqbal Hall, G-7, Islamabad. .		
Department			
Attendances	CDA i. Mr. Ghulam Abbas Mir, Director Revenue ii. Deputy Director Revenue iii. Assistant Director Revenue JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	CDA Tax Rate notification, 12 th January 2001, vide S.R.O 14 (I) 2001		

Discussed

Introduction and preliminary discussion.

At the very outset, JICA Survey Team introduced and explained the objective of this survey. JST also discussed the current situation of Pakistan regarding energy efficiency and conservation in the building sector of Pakistan.

Property Tax System in Islamabad

Number of Taxpayers: A total number of Taxpayers in Islamabad is 50,000 (fifty thousands) out of which 35,000 residential taxpayers and rest of 15,000 commercial taxpayers. Commercial taxpayers include buildings, shopping malls, educational institutions, hospitals and Industries etc.

Definition of property tax: Director stated that once the building is constructed on land, only then tax will be levied on open area of the land as well covered area of the land. Further stated that tax is not levied on piece of land until and unless building is constructed.

Calculation method: Different rate of taxes applied in Islamabad keeping in view of the area based on series i.e. G-Series, F-Series, I-Series and other commercial areas like Blue Area. The annual value of buildings and lands for the purpose of calculation of tax is done by admixture of plot area and covered area of the building thereon multiplied by the respective figures as shown below against each category:

Rating Area and categories	Plot Area (per sq. yd)	Covered area (per sq.ft)
(A) Residential :		
1. E-Series	Rs.6.00	Rs.6.00
2. F-Series	Rs.4.50	Rs.5.25
3. G-Series		
a) Plot area upto 356 sq.yds.	Rs.2.50	Rs.3.20
b) Plot area more than 356 Sq.yds.	Rs.3.75	Rs.4.80
4. I-Series		
a) Plot area upto 356 Sq.yds.	Rs.2.00	Rs.3.00
b) Plot area more than 356 sq.yds	Rs.3.00	Rs.4.50
(B) Commercial		

1. Blue Area a) Ground floor, shops etc	6.00	9.00
	4.00	6.00
b) Mazanine 1st floor and above		
2. Markaz E&F Series		
a) Ground Floor, shops etc.	5.25	8.25
b) 1st Floor and above	3.50	5.50
3. Markaz G&I Series, I&T Centre/Class-III Shopping Centers.	3.50	5.50
4. Fruit and vegetable market	3.00	5.00
5. Industrial Institutions	1.50	3.00 2.25
6. Petrol pump	30.00	Shed Area ----

Source: CDA Tax Rate notification, 12th January 2001, vide S.R.O 14 (I) 2001

Director further stated that following categories of building and land shall be exempt from payment of tax to the extent shown against each category:-

Category	Exemption
1. Residential houses, flats or apartments owned and self-occupied by persons, their family members including parents.	50%
2. One residential house, flat or apartment belonging to a widow if she owns no other built up property anywhere in Pakistan.	100% upto plot area 240 Sq.yds.
3. Places set apart for public worship and actually so used and used for no other purpose.	100%
4. Hospitals, dispensaries, clinics, educational or training institutions and libraries located on the plot allotted for specified purposes and run wholly from charitable contributions and donations.	100%
5. Residential house, flat or apartment owned and occupied by a retired Government employee whether in his own name or in the name of or jointly with his wife or dependent minor children. This exemption shall be available if it is his/her or their only property in Pakistan and he/she or they are themselves living in the house or, as the case may be, flat or apartment. This exemption shall also be available in case of death of the retired employee to the surviving spouse and minor children of the deceased employee.	75%
6. Buildings and lands owned by the Federal or provincial governments, but excluding public and private corporations.	100%
7. Buildings and land vesting in the Capital Development Authority. This however does not include lands leased out to private individuals and corporations, companies and firms or to any group of individuals.	100%

Note: Exemption at S. No.1, 2 and 5 will be allowed on production of affidavit on simple paper for each respective year to be attested by any Officer to be nominated by the Authority for this purpose.

In case the tax is paid by an assessed by 30th September within the financial year for which the tax is paid, he shall be entitled to a discount or rebate of 5 percent.

Source: CDA Tax Rate notification, 12th January 2001, vide S.R.O 14 (I) 2001

Procedure for registration of new buildings

Director informed that Revenue Wing of CDA does not directly register the new buildings rather they facilitate the registration after ownership of the building is communicated by another Wing of CDA i.e. Estate Management Wing. Similarly, as far as the covered of the new building is concerned it is also communicated by the Building Control Wing of CDA and Water Supply connections are communicated by Water Supply Department of CDA.

Tax Collection method

Different rate of taxes applied in Islamabad keeping in view of the area based on series i.e. G-Series, F-Series, I-Series and other commercial areas like Blue Area. The annual value of buildings and lands for the purpose of calculation of tax is done by admixture of plot area and covered area of the buildings.

Detailed data such as floor area for each registration

Detailed data containing taxable floor area was shown to JST. It was further informed that the same data can be provided by CDA I.T Department on request of the Government of Pakistan either Ministry of Water and Power or ENERCON.

Penalties & incentive

Director stated that incentive and penalties are quickly imposed on the defaulters of tax payment. Detail there is as follows:

- i. In case the tax is paid by an assessed on or before 30th September, within the financial year for which the tax is paid, he shall be entitled to a discount or rebate of 5%.
- ii. First surcharge of 1.5% per month in case of non-payment of tax.
- iii. Coercive measures: Disconnection of municipal services like Water Supply, Sewerage.
- iv. Attachment of property of the defaulters but this action is only taken after getting the approval of the Chairman, CDA.

Director further stated that there are 20-30% of violation in tax obligation.

Illegal Buildings

Director stated whichever building is constructed without knowledge and getting approval from the Building Control Department of CDA, it is treated as illegal construction.

JST proposed idea of tax reduction on EE&C building

Upon briefing about JST action plan regarding tax incentive idea, as a revenue authority, there is no objection if government decides to such measures.

MEETING MEMO

Date	11 th December, 2015	Time	03:00 p.m to 04:00 p.m
Organization	Ministry of Climate Change, Government of Pakistan, Islamabad. Venue: LG&RD Building G-5, Islamabad.		
Department			
Attendances	MoCC: Mr. Muhammad Azeem Khoso, Director Urban Affairs. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	National Climate Policy –MoCC 2012 Cities and Climate Change Initiative – UNHABITAT 2014 Climate Change Vulnerability Assessment of Islamabad – UNHABITAT 2014 Seismic Design in Pakistan EARTHQUAKE Risk Reduction – UNDP 2015		
Discussed			
<u>Introduction and preliminary discussion.</u>			
At the very outset, JICA Survey Team introduced and explained the objective of this survey. JST also discussed the current situation of Pakistan regarding energy efficiency and conservation in the building sector of Pakistan.			
<u>Department under control of MOCC</u>			
Director informed that following departments are being controlled by the Ministry of Climate Change, Government of Pakistan, Islamabad:			
<ul style="list-style-type: none"> i. National Disaster Management Authority (NDMA). ii. Pakistan Environmental Protection Agency (Pak EPA) iii. Pakistan Environmental Planning & Architectural Consultants (PEPAC) iv. Global Change Impact Studies Centre (GCISC) () v. Zoological Survey Department (ZSD) 			
Further stated that ENERCON was an attached department of Ministry of Environment. Since devolution of Ministries under 18 th Amendment in the Constitution of Pakistan, Ministry of Environment had been devolved and ENERCON handed over to the Ministry of Water and Power, Government of Pakistan, Islamabad.			
Director recommended that JST must meet this organization			
<u>Projects:</u>			
Director informed that they have done study in the year 2012-2013 (Green City Initiative) but has not yet been operationalized due to transfer of officers from CDA, however, tree planation was done. Further informed that ICT (Islamabad Capital Territory) falls under the jurisdiction of CDA for regulation of operational activities. Director stated according to Cabinet Decision, Islamabad must be made green city.			
Director stated various organizations have already done something on energy efficiency and conservation in the building sector of Pakistan. UNIDO, PEC and Pak EPA have already done study regarding energy efficiency and conservation in the building sector of Pakistan.			

On Director's request, JST explained him necessary measures to be taken before designing of building. Further Director stated since launching National Policy on Climate Change, they have been doing as well as initiating various projects relating to climate change.

Director informed that 23 Projects have been submitted to Green Climate Fund (GCF) for approval, includes 2-3 building projects, and after going through technical aspect and criteria, the projects will be approved and necessary funds will also be released by GCF. GCF thereafter will send Monitoring, Review and Verification (MRV) persons to accordingly check, evaluate and verify the project activities. Director further stated that GCF is not loan rather it is grant given to those countries that got affected badly by climate change.

Capacity Development:

Director stated that they have done and still doing programmes to educate people about climate change. They have already engaged media about building energy conservation and how to protect environments for buildings users.

Data Collection (request from JST)

Responding to JST question regarding electrical bill information for public buildings as per information from KfW, Director informed that no order has been made for collection of data of electricity bills for all government buildings for analysis of current situation of energy efficiency in government buildings.

Current situation in Pakistan

Director stated that CO₂ emission (Green House Gases) Pakistan is not major CO₂ emission contributor less than 1% but Pakistan is very much vulnerable situation. German has ranked Pakistan the 10th most vulnerable in climate change. Further Pakistan has been ranked at 137th numbers in all the countries in the world.

Opinion on proposal:

Director suggested that JST should invite all stakeholders in the seminars for their brainstorming regarding energy efficiency and conservation in the building sector of Pakistan.

Climate Change:

Director informed that climate is changing rapidly in Pakistan. First time in the month of July, 2015, 1,300 people died due to heat wave in Karachi. Even in December, 2015, people have been using fans due to hot weather in Karachi because it is situated at the costal. Further stated that Pakistan is going to be humid like Malaysia, Philippine.

MEETING MEMO

Date	14 th December, 2015	Time	04:00 p.m to 05:00 p.m
Organization	NESPAK Venue: NESPAK Building G-5, Islamabad		
Department			
Attendances	NESPAK: i. Mirza Kamran Hasan, Principal Architect ii. Mr. Aftab Hanif, Senior Engineer and Section Head MEP iii. Mr. Umar, Engineer iv. Miss. Mehwish, Plumbing Engineer v. One Junior Electrical Engineer. ENERCON: Mr. Asad Mahmood, Technical Manager-ECF. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction and preliminary discussion.</u></p> <p>Mr. Asad introduced the project of energy efficiency and conservation in the building sector of Pakistan and explained that JICA has deputed Japanese experts in Pakistan for gathering data in building sector of Pakistan to analyze the current situation so that Building Code of Pakistan (Energy Provision) (hereinafter referred to as 'BCP-EP-2011') could be implemented in true letter and spirit. Mr. Asad further explained that ENERCON is actively working on this issue and also have plan to prepare Compliance Handbook for BCP-EP-2011. He informed that Energy Efficiency and Conservation Bill, 2014 is under discussion in the parliament of Pakistan which likely to be approved by both houses soon thereafter it will become bylaws in Pakistan. Further informed since the powers have been transferred to the Provinces under 18th Constitutional Amendment, therefore, provinces have capacity and power to get BCP-EP-2011 enforced. However, Mr. Asad stated that ENERCON as well as JICA Survey Team (hereinafter referred to as 'JST') would propose enforcement of implementation of BCP-EP-2011 from Islamabad as action plan in the future.</p> <p>JST explained the objective of this survey and the current situation of Pakistan regarding energy efficiency and conservation in the building sector of Pakistan.</p> <p><u>NESPAK activity</u></p> <p><u>1) Terms of energy efficiency and conservation in building sector</u></p> <p>Principal Architect informed that NESPAK was established in 1973. It is Pakistan's premier consultancy organization and it enjoys the reputation of being one of the top engineering consultancy organizations in Asia and Africa and is ranked amongst the world's top 200 consulting firms. It is only one organization in Pakistan that have all facilities under one roof in one door.</p> <p>Further stated that NESPAK undertakes large/high scale projects that include Dams, Highways, Irrigation Systems, Airports, High Rise buildings, institutional buildings, and public sector buildings etc.</p> <p><u>2) BCP-EP-2011</u></p>		

NESPAK informed that they were not the part of building code of Pakistan (energy provision-2011), but ultimately they have to follow it accordingly. Further stated that Pakistan does not have energy bylaws as the other countries have e.g. USA Green Building Council, so the government has to take lead in energy efficiency.

3) Recent Projects undertook by NESPAK

NESPAK informed that they have recently undertaken following projects in which they tried to inculcate energy efficient system and efficient HVAC system that saves approximately 55% energy only due to insulation of building envelop. NESPAK is also focusing on Grey Water Recycling in the buildings because Pakistan needs pure drinking water.

- i. Ufone Building, Blue Area Islamabad.
- ii. Stock Exchange Building, Blue Area Islamabad
- iii. UET Jalozai Campus, Peshawar

4) Clients of NESPAK

On question of JST, NESPAK informed that its clients are both Government and Private. They have been undertaking both public sector projects and private projects not only in Pakistan but overseas as well. As far as proposal of green building is concerned, it is proposed by clients in some cases NESPAK proposes but when the clients think that cost will go up, they do not opt for green building. Major problem of the clients is insufficient budget for adoption of EE&C appliances, thus, they prefer adoption of conventional system or appliances in order to cut cost down.

Situation of building construction

1) Origin of BCP-EP-2011 and safety bylaw

Mr. Asad from ENERCON stated that building code of Pakistan (energy provision-2011) was prepared while modifying the ASHRAE 90.1 standards. Since the issuance of SRO, more than two years has been passed but no Development Authority has yet been adopted BCP-EP-2011 for vetting. On the other side, NESPAK stated that there is no proper safety bylaws in Pakistan to meet the safety challenges which is also of the paramount importance.

Further stated that if the Government of Pakistan is committed for BCP-EP-2011 compliance, it shall be enforced by by-law otherwise it is too difficult to make it mandatory.

2) Procedure from design to completion of building

NESPAK informed that they submit drawings to CDA for its approval and once approval is given by CDA, construction will start. After plan approval, inspection by CDA are just formalities to be conducted e.g. regular visit to project, completion certificate. Actually after approval, CDA does not maintain checking in detail that whether the building has been constructed according to specification other than floor plans , set-

backs and height.

3) Project Managers (Individual) and vendors.

On request of JST, NESPAK informed that no professional project managers in Pakistan exist but it exist in UAE and USA. In Pakistan, there is no Construction Management Company too. As far as registered/approved vendors of NESPAK are concerned, list of them shall be provided in due course of time.

4) Scope of work in construction.

Scope of work for construction contract depends on the client policy and scale of the project. In some cases, contractors scope covers everything, in which contractor have to purchase all equipment as well as material for construction of building in accordance with the design prepared and wishes of the owner. On the other side, in Developer/ Builder projects, Contractor provides labor and basic material only, owner himself to purchase major materials for construction of the building to save cost.

In NESPAK project, scope of work is depends on the character of project. In some project for example, if electrical work package is so complex, client may decide to separate electrical work contract from other building contract.

5) Comparison of Japan and Pakistan in terms of construction cost.

JST informed that construction cost in Japan is four times or more than Pakistan but in terms of electric bills cost Pakistan is 70% of Japanese cost. Considering the fuel cost for generator, the cost for electricity in Pakistan could be higher than Japan. Load shedding which Pakistan presently facing is 6-8 hours in summer and 4 hours in winter in urban areas.

6) Cost of LED lights, energy saver and CFL.

NESPAK stated that there is remarkable difference between LED lights and CFL. LED can conserve energy more than CFL. As regards prices, LED makes competition with other conventional lights. Further stated that NESPAK is the opponent of energy saver because of its power factor. Previously energy savers were having label of power factor that has not mentioned now in the market.

Further stated that when LED lights were newer in the market, NESPAK did not adopt it until and unless it is experimented by end users.

Situation of building operation

1) Ufone building electricity contract

NESPAK informed that they designed Ufone building. Completed in 3-4 years ago with Rs 4000/sqft. (8-10 years ago rate)

On request of JST, NESPAK informed due to bylaws of WAPDA in case that electricity load is beyond 63 kV, building owner should purchase electricity in bulk. Despite mentioned bylaws, in almost of such buildings, tariff meters are installed by tenants or by floor and Ufone building case may be exception. Further Ufone building was acquired by Telecommunication Trust for its own offices. To purchase electricity in Bulk is more economical than general purchase contract. Some portion of office space are rented out for tenant and electricity and other running cost are charged based on floor area of tenant as general expense.

During defect liability period, one year after practical completion, NESPAK was involved in issues arisen. After passed liability period, some other maintenance company is taking care of Ufone building.

2) Ratio of energy consumption in operational

NESPAK informed that AC is mainly using energy in all buildings. AC usage is also growing higher day by day. In case that building require 2,000 kVA of electrical contract with AC system, if the building does not use AC, electric demand would reduce to approximately 500 kV. So AC is most energy consuming appliance. So in percentage, NESPAK ranks AC consumes 80% and other 20% for rest of lighting and other appliances.

EE&C in the building sector

1) Usage of insulation and double glaze

NESPAK informed that most of their new projects are using double glazing. Double glaze is locally available in Pakistan but Low-E glaze is not available, thus, it is imported mostly from Dubai.

2) Lighting fixture and HVAC system

NESPAK informed that its HVAC Section is not in Islamabad rather in Lahore and Karachi. As for lighting fixture, NESPAK focuses on LED and proposing 100% deployment of LED. They would like to abandon all conventional energy savors and other lights and have been using energy labelled having star rating LED lights imported from other countries. Further stated that NESPAK follows LEED guidelines if client agrees. For example, they propose one switch for one light fixture separately in order to provide maximum operational flexibility to save consumption. Similarly, they use timer exhaust fans in the wash rooms, if someone for example, forgets to switch off exhaust fan, it should automatically be switched off after fixed time. Notwithstanding, NESPAK is also going for brass sockets instead of copper cables because copper cable has chances of losses while former does not have. Motion sensors are available in Pakistan.

Discussion of action plan

Tax incentives for energy efficient buildings

NESPAK informed that government of Pakistan should introduce and offer tax subsidy concepts while making sure that whosoever complies the green building, he/she deserves to be incentivized.

Retrofitting of the buildings

NESPAK stated that they have done HVAC retrofitting of Pakistan Medical and Dental Council (PMDC) building situated in G-10, Islamabad. NESPAK is also going to replicate that in President's Secretariat, National Assembly Secretariat, Islamabad.

JST proposal of architectural software for cost analysis

JST explained software having very simple features to be introduced. NESPAK stated that they neither have any software nor have license to use such software.

NESPAK stated that comparison between investment and running cost is very useful for private sector client who is concerned for entire economics. However, in government projects, due to the demarcation, person in charge of building budget is less concerned on running cost and focused on minimizing initial cost. There is a document indicating standard building cost rates. If government leading action is to be carried out, revision to general specification as well as cost rate base must be revised.

Barriers

- End users are not well aware about energy efficiency and conservation.
- Market is not well versed with energy efficient technology.
- Lack of good manufacturers/suppliers in local.
- High energy performance electrical/ mechanical equipments are only available by import and lacks capacity of maintenance in local.
- Contractors need to be training to meet the provisions of BCP-EP-2011.
- Developers need to be educated to full requirements mentioned in BCP-EP-2011.

MEETING MEMO

Date	15 th December, 2015	Time	11:00 a.m to 12:00 noon
Organization	UNIDO Pakistan Venue: 7th Floor, Serena Business Complex, Islamabad		
Department			
Attendances	UNIDO: <ul style="list-style-type: none"> i. Esam Alqararah, UNIDO Representative. ii. Miss. Ghazala National Project Manager (Renewable Energy) iii. Mr. Ali Yasir, National Project Manager (Sustainable Energy-Biomass) iv. Masroor Ahmed Khan, National Project Manager (Sustainable Energy-RE &EE). ENERCON: Mr. Asad Mehmood, Technical Manager-ECF. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Introduction and preliminary discussion.</u></p> <p>Mr. Asad introduced the project of energy efficiency and conservation in the building sector of Pakistan and explained that JICA has deputed Japanese experts in Pakistan for gathering data in building sector of Pakistan to explore possibilities for energy efficiency and conservation. He further stated that JICA Survey Team heard some activities of UNIDO therefore, preferred to have meeting with UNIDO to discuss and share ideas so that energy efficiency activities could not be overlapped.</p> <p>Mr. Hirooka explained that project titled gathering data on energy efficiency and conservation in building sector of Pakistan started in June, 2015 and Survey Team has been focusing primarily on EE&C in building sector and trying to capture what is practically happening on the ground. Pakistan Engineering Council in collaboration of ENRECON has prepared Building Code of Pakistan (Energy Provision-2011) but these codes have not yet been adopted by any of the development authorities in Pakistan. However, high rise buildings might have been following in the way of putting insulation in the envelope as well as in walls alongwith double glazed windows and LED lights.</p> <p>Anyhow, at this stage, JST has been collecting data, thereafter, would propose to ENERCON necessary measures for energy efficiency and conservation in building sector of Pakistan.</p> <p><u>Project of UNIDO</u></p> <p>UNIDO informed that they have developed the project of renewable energy/solarization of five buildings of Federal Board of Revenue in Islamabad on the initiative of Ministry of Climate Change. Feasibility study of the project was conducted with collaboration of AEDB (Alternate Energy Development Board).</p> <p>Selected five buildings of FBR will be demonstration in Islamabad. This project has not yet been approved by UNIDO Head Office but under consideration to be finalized soon. At this stage it is conceptual project until it is approved and executed accordingly. UNIDO stated that they heard that such kind of projects have been initiated by JICA as well. JST responded that they do not know about such activities of JICA because</p>		

JST's task is energy efficiency and conservation in the building sector of Pakistan.

Funds of the project:

According to UNIDO, following funds shall be provided by respective organizations as mentioned below:

- i. 1.36 million \$ from Global Environmental Fund (GEF).
- ii. 1.4 million \$ from Federal Board of Revenue (FBR), Islamabad.

Other costs:

- i. 70,000.00 \$ from Global Fund for training, facilitation etc.
- ii. 120,000.00 \$ as agreed by ENERCON co-financing for associated training programme, facilitation.

Sub-activities

- i. Optimization of software for energy building code. The software under consideration are US base ENERGY PLUS and eQUEST energy compliance software but that has not been finalized yet. This software has to be licensed. (JST also informed that JICA is considering introducing building design software which to compare initial investment and energy savings with very simple features.)
- ii. Energy Audits of buildings, it could be integrated with energy efficiency and conservation project of JICA, if applicable.

Programme loan of JICA, ADB, WB

On request of UNIDO, JST informed that this is programme loan to be provided by JICA, ADB and WB international donor agencies. Already two years have passed. JST is working at 3rd year stage.

Solarization project.

UNIDO informed that feasibility study of this project was completed with collaboration of Alternate Energy Development Board and Ministry of Climate Change. Further stated that this is 2.5 years project. Actually this initiative was taken by MoCC and then was forwarded for finance. This project will energize five buildings of FBR with 590 KW solar system which will cover 22% of required electricity demand of those buildings. UNIDO informed that study report conducted by them has not yet been published formally. On request of JST, UNIDO informed that they will ask the seniors permission to share this report with JST, if allowed; accordingly they will send report to JST.

Particularly stated that this is conceptual stage of the project, other things like to conduct detailed survey on lighting etc shall be conducted once the project is approved and according to requirement.

JST proposal/action plan

JST explained the plan to be proposed to ENERCON for energy efficiency and conservation in the building sector of Pakistan that was appreciated by UNIDO. They further suggested that at least insulation in houses may prove to be comfortable living because in summer season upper floor of the house becomes like stove. Concept of hot water pipe insulation is not well familiar.

It was informed by the JST that payback period of insulated envelope investment is 2 years or less according to some other expert Architects in Pakistan.

Electricity Supply to residential as well as industrial from one feeder.

Mr. Asad stated that there are few dedicated feeders that only supply electricity to industrial area but there are also some domestic feeders that are supplying energy to residential areas as well as industrial. This factor cannot be ignored while measuring electricity consumption of domestic as well as industrial.

Energy Efficiency and Conservation Bill, 2015

Mr. Asad explained the current status of EE&C Bill that is likely to be tabled in the parliament for necessary discussions and approval. Once it is approved by National Assembly it will be placed before Senate for approval. Thereafter it will be enacted and will become bylaws in Pakistan.

MEETING MEMO

Date	16 th December, 2015	Time	11:00 a.m to 12:00 noon
Organization	IMS Karachi Venue: 2 nd Floor, ENERCON Building, G-5 Islamabad (Video Conferencing)		
Department			
Attendances	IMS: Mr. Haseeb and his team on video conferencing ENERCON: Mr. Asad Mehmood, Technical Manager-ECF. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	Integrated Building Management System (iBMS) Controlled Document engineered by IMS		
Discussed			

Introduction and preliminary discussion.

Mr. Asad from ENERCON introduced the JICA Survey Team on video conferencing.

Market Scale

Mr. Haseeb Rehman introduced the IMS and stated that IMS is 30 years old engineering operating organization in Pakistan and having its offices in other countries e.g. UAE, Bangladesh, Sri Lanka etc.

The solutions served by IMS help customers in a variety of industries to perform with greater efficiency, safety and cost effectiveness. Its ability of turnkey integration in complex electro-mechanical environments brings IMS at par from local competition.

IMS primarily focuses:

- i. Instrumentation supplies.
- ii. Catering for commercial & industrial needs.

Type of instrumentation supplies varies between following and the majority of the systems supplied are supported by exclusive representation of world renowned manufacturers.

- a. Building management systems.
- b. Fire alarm systems.
- c. Fire suppression systems.
- d. Gas detection systems.
- e. Temperature & pressure gauge instruments.
- f. Temperature humidity control systems.
- g. Security control system.
- h. Access control systems and other programmable logical control systems.

IMS local capabilities include:

- a. Turnkey system sales.
- b. Project management and coordination.
- c. System installation.
- d. Applications engineering.

- e. Programming and Testing.
- f. Site startup and technical assistance.
- g. Customer training
- h. Warranty support.
- i. Maintenance support.
- j. After startup technical assistance and local support

IMS has been focusing on large scale projects having very reputable companies/firms/organization as its clients. Main clients are as follows:

Islamabad: A total number of clients in Islamabad is more than 50 including the following:

- United Nations House Pakistan
- Islamabad Stock Exchange
- Serena Hotel
- Mobilink

Lahore: A total number of clients in Lahore are more than 15 including the following:

- MCB Tower.
- Allama Iqbal Airport
- LUMS
- Technology Park
- Forensic Science Laboratory
- Mall of Lahore
- WAPDA House

Karachi: A total number of clients in Karachi are more than 100 including the following:

- MCB Tower.
- State Life Insurance Corporation.
- Faysal Bank
- Finance and Trade Centre
- Expo Centre.
- Sui Southern Gas building.
- The Aga khan University, Hospital

Hospitals and Pharmaceutical Companies: IMS is also taking care of following hospitals and pharmaceutical companies:

- Novartis Pharmaceutical company
- Glaxo Smith Kline Pharmaceutical Company.
- Sanofi Pharmaceutical Company.
- Shaukat Khanum Memorial Hospital in Peshawar.

Power Consumption of by A.C

IMS stated in summer A.Cs consume lot energy. Ratio for usage of A.Cs and chillers average 70% in

Pakistan because a large number of people as well as organizations are using air-conditioning system that consumes much energy in all spheres. Power consumption by A.C is roundabout 60% of total consumption by building.

There are a number of centrally air-conditioned buildings in all major cities of Pakistan and still new buildings are being constructed centrally air-conditioned especially for Hotels, Hospitals and some office buildings. However smaller individual buildings are using separate split air-conditioners to cool the buildings.

Further air-conditioning chillers reduce operating cost in the buildings if used. The negative side of central system is its billing system in case of divided floor usage. There is a case that a tenant refuse to pay AC expense based on floor area and disconnected from system and install split AC by themselves.

Climate of Karachi, Islamabad and Lahore

IMS stated that climate of Karachi is becoming humid and it is important to reduce humidity in order to improve living environment during summer seasons. While Islamabad and Lahore's climate is low humid and dry as compare to Karachi, hence, summer is too hot in Islamabad and Lahore and may require adding humidity to improve environment. Similarly in other cities of Pakistan, most of cities are dry/low humid and coast side are becoming humid.

Legal framework for maintenance for post completion.

IMS informed that there is no legal system for post completion building maintenance in Pakistan. Even no electrical appliance standards have yet been developed. Building owner do the maintenance or improvement on their own choices. As far as the fire protection is concerned, it is only National Fire Protection Agency (NFPA) that has legal framework in place. New buildings have to follow legal regulations of NFPA and the buildings are also responsible for fire protection systems in the buildings. There is another association namely Fire Protection Association of Pakistan (FPSA) promoting fire protection awareness and advancement in Pakistan.

BMS in buildings under maintenance of IMS

IMS informed that they have been maintaining hundreds of buildings in major cities of Pakistan in which 99% is operating with some kind of BMS. Only 1% is not covering BMS.

Competitors of IMS

IMS informed that that it is pioneer in Pakistan because it provides all kind of services, not only maintenance but action to improve building operation and maintenance for client benefit which other companies do not. There are 4 other competitors of IMS but these companies do not provide many services as IMS provides. Name of competitors are Khan Control System, Haseen Habib etc. Other majority of maintenance company provides minimum services like housekeeping.

Staff of IMS

IMS stated that they have total staff of 400 employees out of which 300 have been working in Pakistan others in UAE.

Background of Staff/qualification

IMS informed that there are following categories of staff:

- a. Certified engineers 40%
- b. Technical diploma holders 30%
- c. Rest is office staff.

Hierarchy of the staff

IMS informed that there are number of staff members/engineers who are deployed to the respective facilities and if any employees thinks to approach the IMS office they come in Office. Further every engineers has been provided smart phone facility so that he can quickly communicate the other engineers subject to necessity.

In case of the facility in rural area then customers provide boarding and lodging facilities to IMS staff.

Hierarchy is as follows:

- a. Project Manager (Regular employee of IMS)
- b. Team Leaders (Regular employee of IMS)
- c. Technical workers (Regular employee of IMS)
- d. Unskilled labour (hired on contractual basis)

Capacity Development of Staff.

IMS informed that every engineer who is appointed in IMS has to get factory training certificate as well as BMS training that are conducted in house.

Idea for energy efficiency and conservation (retrofitting of the buildings)

Architectural area of the building: IMS suggested that building designs should be more passive to make buildings energy efficient.

Mechanical Area of the building: IMS informed that material should be used of the good quality. Better insulation is of an utmost importance. Double glazed windows should be adopted or reflective sheet for glass. Air management of buildings should be clearly demarcated.

Electrical Area of the building: Electrical appliances should be used having energy efficient factor that ultimately leads to contribute in consuming less energy in the buildings.

Operational Area of the building: Energy consumption and space environment could be improved by smart operational policy. For example, turning-on the AC earlier than office opening time will provide better office

environment without consuming additional power due to the less heat load to machine. Also, AC could be turned off earlier than office closing time to save cost without compromising office environment.

Incentives: Incentive is very much important to be provided to the owner of the buildings to adopt more energy efficient models.

Does IMS propose retrofitting of buildings to add insulation and double glazed

IMS informed that double glazed and insulation solution in retrofitting is bit expensive, thus, people do not prefer to increase their more expenditure though it would reduce energy cost and will payback.

Calculation method of buildings floor area for chillers

IMS informed that they follow the calculation method of building floor area as follows:

- a. Cubic volume to be used in the building.
- b. Number of people in the buildings.
- c. Geographic location of the building

There is method of USRTR, after calculating, they approach the chillers whatever to be installed that task is carried out by HVAC Consultants.

Chillers manufacturers:

IMS informed that following major chillers manufactures they prefer:

- a. Kawasaki chillers
- b. Schneider chillers
- c. ABB chillers
- d. Broad chillers.
- e. York chillers
- f. Mitsubishi chillers.
- g. LG chillers.
- h. Shingling chillers (china)

However, IMS will share list of manufactures they follow.

Barriers

- For electrical purpose, hotels and factories are using more energy that need to be catered with.
- There is issue of upfront capital investment. People do not want to spend huge amount for energy efficient buildings with the aim of its payback after 5 or more.

MEETING MEMO

Date	17 th December, 2015	Time	11:30 a.m to 12:30 p.m
Organization	CDA Venue: CDA Head Office, G-7 Islamabad.		
Department			
Attendances	CDA: <ul style="list-style-type: none"> i. Mr. Waseem Khan, Member Development. ii. Director General Engineering and Maintenance. iii. Mr. Ghulam Abbas Mir, Director Revenue. iv. Mr. Zahid Sultan, Director Building Control ENERCON: Mr. Asad Mehmood, Manager Technical ECF. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	-----		
Discussed	<p><u>Introduction and preliminary discussion.</u></p> <p>Mr. Asad introduced the project of energy efficiency and conservation in the building sector of Pakistan and explained the objective of this survey.</p> <p><u>Presentation on energy efficiency and conservation and opinion of CDA</u></p> <p>A formal presentation highlighting the current energy scenario and its countermeasures alongwith proposal of action plan was accordingly delivered by JST to get opinion of CDA.</p> <p><u>Additional cost and EE&C potential in case of adoption of BCP-2P-2011</u></p> <p>1) <u>Additional cost for construction of building</u></p> <p>At the very outset, Member asked question what would be additional cost of construction if a building is constructed according to Building Code of Pakistan (Energy Provision-2011). JST explained that additional cost for construction of building would be PKR 250 to 300 per sq.ft but that cost will pay back within short period of time.</p> <p>In comparing construction cost per unit floor both of in Japan and in Pakistan, construction cost per unit floor in Pakistan is 25% or less of Japan, but unit price of electricity in Pakistan is only 70% of Japan. Estimated payback period in Pakistan is expected to be less than 20 months.</p> <p>2) <u>EE&C potential</u></p> <p>On question of Member, JST informed that upto 30% per month conservation of energy is expected. For example, if somebody is paying PKR10,000/- bill per month his bill can be reduced to PKR7,000/- per month while adopting BCP-EP-2011.</p> <p><u>Request to Model City action by CDA for BCP-EP-2011.</u></p> <p>JST informed that they are proposing Islamabad as Model City for energy efficiency and conservation in the buildings in consideration of the capability of CDA and its relationship with federal government. Thereafter, same will be replicated nationwide within defined period of time.</p> <p>Member suggested that JST should have meeting with Ministry of Housing and Works to get an Act issued so that Energy Provision could be implemented in true letter and spirit. Further stated that if the Government takes firm action for implementation of Energy Provision, it will be binding upon all the development authorities throughout Pakistan.</p> <p><u>Feasibility for adoption of BCP-EP-2011 on CDA</u></p>		

Member stated that CDA can adopt important 4 or 5 major points subject to approval of Board. Director Building Control also agreed to adopt important points.

Legal basis for adoption of BCP-EP-2011

1) Energy efficiency bill

Mr. Asad stated that energy efficiency and conservation bill is going to be tabled before the Parliament for its approval. However, even in the absence of Act, there is a SRO with Pakistan Engineering Council under which this can be implemented.

2) Penalty in BCP-EP-2011

On request of CDA, JST informed that under BCP-EP-2011 professionals shall be penalized if building is not constructed according to BCP-EP-2011. Member stated that penalty can only be imposed under law, but there is no law at the back of this code. Legislation is of an utmost importance to penalize the offenders.

3) In case of Seismic code (action for No legal shelter)

Member stated that despite CDA has seismic code but there is no legal shelter in Pakistan. Now CDA has requested the government for necessary legislation and government has forwarded it to the Pakistan Engineering Council to frame it.

Opinion of CDA against trade off idea regarding floor area ratio

Member stated that if floor area of the building is increased that will also increase energy consumption in the buildings; therefore, he suggested that additional floor area is not advisable. However, other proposals given by JST are quite feasible/applicable therefore can be accepted for adoption. JST responded that in the long term view, more floor area with optimized energy usage will benefit to the society, given the fact of housing backlog and expected population increase in urban area as indicated in the presentation.

Building maintenance carried out by CDA

Director General Engineering and Maintenance stated that presently they have been maintaining 16,000 domestic buildings/houses in Islamabad. They have also been maintaining a large part of Government Buildings in Islamabad particularly Pakistan Secretariat. He further stated that some buildings are being maintained by Pak PWD that includes Supreme Court of Pakistan and Prime Minister Secretariat, Islamabad.

Compliance Handbook (Information sharing from ENERCON)

Mr. Asad stated that ENERCON is planning to prepare comprehensive Compliance Handbook and would also provide training facilities to the relevant professionals so that energy provision could be implemented accordingly.

MEETING MEMO

Date	21 st December, 2015	Time	12:00 noon to 01:30 p.m
Organization	IESCO Venue: IESCO Head Office, G-7 Islamabad		
Department			
Attendance	IESCO:- i. Engr. Wasif Hussain Khan, General Manager (Operation). ii. Mr. Waheed Akram, Director CS iii. Mr. Khalid Masood, Additional D.G IS. iv. Presenter. JST: Mr. Hirooka, Mr. Kuroki, and Mr. Ilyas		
Obtained Documents	Powerpoint presentation Load shedding schedule 2015		
Discussed			

Introduction and preliminary discussion.

JST explained that they have been conducting survey to analyse the current situation of energy efficiency and conservation in building sector of Pakistan. JST stated that it has particularly been working on demand side of energy and is committed to suggest countermeasures to the Government of Pakistan to cope with energy crises in Pakistan. Further explained Pakistan Engineering Council in collaboration with ENERCON has developed Building Code of Pakistan (Energy Provision-2011) but that has not yet been adopted by any of the development authorities in Pakistan.

JST accordingly delivered presentation explaining the findings relating to energy efficiency and conservation in Pakistan and certain proposals to be accepted by government to conserve energy particularly in the building sector of Pakistan while making Islamabad as Model City.

Presentation by IESCO based on agenda of JST was accordingly delivered. The same is shown here.

Load shedding and electricity demand in IESCO

On request of JST, it was informed that IESCO's suppress demand is 2,200 to 2,300 M.W. Load shedding is divided in four seasons and it varies from one to another. Total electricity shortfall is 5000-6000 M.W in Pakistan out of which only 10% shortfall IESCO faces. Further stated that IESCO groups feeders to supply energy in different areas during load shedding hours. IESCO also focuses that frequency should be the same. IESCO stated that better load management is being observed for the last year due to escalation in electricity generation, this is done due to decreasing price of furnace oil. Previously prices of furnace oil were at peak in the year 2013 but now it has been reduced almost half, therefore, energy is being generated cheaply comparatively.

Further stated that IESCO is considered at top number in Pakistan comparing to other Discos in terms of load management.

Generation of Electricity

IESCO informed that Dams in Pakistan are built particularly for irrigation purposes and they are generating 40% electricity from hydro and rest of from thermal. Fuels are not indigenous and Pakistan imports oil thus electricity produced by thermal is vulnerable in price escalation in international oil market.

Load shedding occurred in last 12 months.

IESCO informed that load shedding in urban area is observed to be 6 interruptions with 6hours per day at most, while in rural area it is to be 8 interruptions with 8hours. This means, after every three hours, there is a hour of interruption in urban areas and after every two hours there is a hour of interruption in rural areas. IESCO does not change time of interruption so that residents/people should be well aware of load shedding timing. They lift load in evening until morning in the winter season. Further stated that in winter season, electricity demand is decreased while in summer it increases due to massive usage of air-conditioners.

IESCO-DATA OF MAX / AVG MONTHLY INTERRUPTIONS OF URBAN,RURAL AND INDUSTRIES (JAN-15 TO 20 DEC-15)											
Sr. No	Month	Urban (Hrs)		Rural (Hrs)		Textile (Hrs)		Mix (Hrs)		Furnance (Hrs)	
		Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg
1	Jan-15	10	6	12	7	10	8	10	8	10	8
2	Feb-15	6	5	9	7	2	0	2	0	2	0
3	Mar-15	6	5	8	8	4	2	4	2	4	2
4	Apr-15	6	5	10	8	8	4	8	6	8	4
5	May-15	6	6	8	8	4	2	6	4	4	2
6	Jun-15	6	5	8	7	0	0	4	4	0	0
7	Jul-15	6	3	8	4	9.30	4	9.30	4	9.30	4
8	Aug-15	6	6	8	8	4	2	4	2	4	2
9	Sep-15	6	6	8	8	4	4	4	4	4	4
10	Oct-15	6	4	8	7	0	0	0	0	0	0
11	Nov-15	4	3	8	5	0	0	0	0	0	0
12	Dec/2015 (up to 20-Dec)	6	4	8	7	0	0	0	0	0	0

Residential and commercial usage of electricity

There are some residential areas that using commercial electricity because they are running their business. Further stated that whenever there is business activity in the residential area, IESCO Meter Reader, who visits the place every month, points out commercial activities. On his pointation, IESCO changes the tariff from residential to commercial wherever it is necessary. So numbers from IESCO is reflecting actual activity.

Electricity connection to Flat/Higher apartment.

IESCO informed that flats/apartments are residential, thus, they are provided residential connection. However, if IESCO found that residents are using electricity for business purposes, they tariff is accordingly changed to

commercial.

Electricity connections to buildings having commercial shops at entrance.

It was informed that electricity connections to the buildings are provided keeping in view of their status whether it is residential or commercial. In case of commercial, it is provided commercial connections. In case of residential, it is provided residential connections. As far as shops at the entrance of buildings are concerned, these shops necessarily provided commercial connections. Customer may apply, i) one commercial contract or ii) two separate contract for commercial portion and residential portion.

Study carried out by third party regarding theft in IESCO

IESCO informed that a study of 180 feeders (20% of total feeders) was conducted in order to know the actual losses/theft in IESCO. According to study, it was noticed that IESCO has theft/losses of energy 9.4% while other discos might have maximum 35%. In comparison of other discos, IESCO is at better position regarding theft/losses of energy.

Last five years growth in electricity

IESCO informed that demand for electricity is increased in the last five years. Whosoever comes and applies for electricity connection, IESCO accordingly grants it.

Due to construction of new buildings, a number of consumers increased that ultimately increased the electricity demand. Some people might got another new connections in their homes based on two floors.

In addition to the information provided for the breakdown of contract number and consumption in 5 district, information for the last five or more years will shortly be provided.

CIRCLE WISE/TARIFF WISE CONSUMERS

(November, 2015)

Tariff	Islamabad	Attock	Rawalpindi	Jhelum	Chakwal	Total
Domestic	318,666	419,372	679,931	289,606	412,390	2,119,965
Commercial	58,229	54,991	159,572	41,212	41,488	355,492
Industrial	2,402	3,901	4,691	1,648	2,573	15,215
Bulk Supply	155	137	458	78	37	865
Tubewell	634	3,995	908	939	1,753	8,229
St. Light	731	185	618	92	60	1,686
H/ Col – Fac	2	10	11	6	12	41
Tariff K	4	-	59	44	-	107
Total	380,823	482,591	846,248	333,625	458,313	2,501,600

Electricity to large shopping malls

IESCO informed that that they provide electricity supply in bulk to large shopping malls and if there is residential area at upper floor of the shopping malls, then IESCO provides individual and separate connections to avert the dispute on usage of electricity.

Planning of government to eliminate load shedding

IESCO informed that Government of Pakistan is going to increase electricity generation. Neelum Jhelum will come to national grid. Some renewable resources planned to be utilized. Small hydro, thermal and solar projects planned to be started with the aim to cope the energy crises until 2017-2018. The government is firmly committed to eliminate this issue. If so, 6000-8000 M.W additional electricity will be added in national grid. However, 2018 is also general election year in Pakistan and government does not want to lose its position rather wants to get another five years to form government, therefore, government is fully determined to deal with energy crises.

Privatization of Discos

IESCO informed that Government is going to privatize Discos fully or on partnership basis to make it more efficient. Further stated that new private companies are also allowed to generate electricity in Pakistan but it cannot distribute at the moment.

MEETING MEMO

Date	22 nd December, 2015	Time	03:00 p.m to 04:30 p.m
Organization	USAID Power Distribution Program (closed). Venue: Conférence Room, Best Western Hotel, Club Road, Islamabad.		
Department			
Attendances	USAID: Mr. Muhammad Saleem, Deputy Chief of Power Distribution Project of USAID that has now closed. PEC: Eng. Faiz ul Sibtain. JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents	USAID Power Distribution Program-(2010-2015)		

Discussed

Introduction and preliminary discussion.

Before starting discussion Mr. Muhammad Saleem introduced himself and stated that he has been working in power sector for the last 40 years and he also remained CEO of MEPCO. Recently was Deputy Chief in Power Distribution Program of USAID that has now been closed in the last month while achieving its successful targets.

USAID Power Distribution Programme

He stated that Power Distribution Programme (PDP) provided Government of Pakistan through USAID to support the energy sector. PDP was a five year (2010-2015) \$218 million program that was launched in September, 2010 aimed to facilitate improvements in Pakistan's government-owned electric power DISCOs through interventions and projects addressing governance issues, technical and non-technical losses, and low revenue collection. The main goal of PDP was to improve the commercial performance of the participating DISCOs through technology upgrades and improvements in processes, procedures, and practices as well as training and capacity building. PDP also assisted the Ministry of Water and Power and the regulator-National Electric Power Regulatory Authority (NEPRA) to improve power sector governance, the regulatory framework and their operational capacity. PDP supported the Privatization Commission for moving closer towards the privatization of DISCOs.

Major areas of work includes:

- Strengthening governance and policy reforms
- Improving load management and operations.
- Loss reduction and revenue improvement
- Training and capacity building.
- Communications and consumer outreach.
- Gender participation.

Focused DISCOs in PDP

Since 2013, PDP activities focused on two DISCOs that is PESCO delivering power to 2.9 million consumers (23 million people) in the province of KPK and MEPCO delivering power to 5 million consumers (33 million people) in southern Punjab. These two companies are responsible for more than 38% of losses incurred by all the DISCOs. The improvements introduced by PDP have increased the revenues of DISCOS

by approximately \$400 million and have eliminated as much as \$180 million in annual losses to Pakistan economy.

Achievement through PDP, USAID

He stated that through Power Distribution Programme, they achieved following targets:

- Increased the revenues of DISCOs by upto \$400 million a year.
- Eliminated upto 85% of unscheduled load shedding countrywide
- Reduced Pakistan's economic losses by upto to \$180 million a year.
- Reduced losses and demand by more than 200 megawatts-enough to continuously supply electricity to 400,0000 homes.
- Improved governance in the DISCOs.
- Improved financial management for all DISCOs.
- Improved load management and operations.
- Commercial losses reduction by replacing energy efficient industrial motors.
- Reduced energy demand by replacing energy efficient tube-well in agricultural areas.
- Technical losses reduction.
- Training and capacity building of DISCOs.
- Improved communications and consumer outreach.
- I.T training programs offered for IESCO's female staff to improve women participation.

Expected future projects of USAID in energy sector.

Mr. Saleem briefly stated that USAID at the moment planning to launch new project titled 'clean energy' in Pakistan which is more on renewable energy side. This project would be more focused on generation of energy by wind, solar and small hydro. Its components are as follows:

- i. Generation of electricity.
- ii. Transmission of electricity.
- iii. Distribution of electricity.

Future planning of government of Pakistan to eliminate energy crises.

He stated that Government of Pakistan seems very serious about energy crises. There are following power complexes under construction to be run on coal because mentioned areas have abundance of coal:-

- a. Thar
- b. Karachi.
- c. Jamshoro
- d. Sahiwal

By the end of 2018, almost energy shortfall will be eliminated if government initiative remains successful.

MEETING MEMO

Date	23 rd December, 2015	Time	11:00 a.m to 12:30 p.m
Organization	ENERCON Venue: ENERCON Building G-5 Islamabad.		
Department			
Attendances	ENERCON: Mr. Asad Mehmood, Technical Manager-ECF JST: Mr. Hirooka, Mr. Kuroki, Mr. Kohno and Mr. Ilyas		
Obtained Documents			
Discussed	<p><u>Discussion with regard to wrap-up meeting</u></p> <p>JST explained that almost they have finalized its survey on energy efficiency and conservation in the building sector of Pakistan and discussed the rough budget estimate that government of Pakistan has to prepare for each action plan in order to implement BCP-EP-2011 for energy efficiency and conservation in the building sector of Pakistan. Mr. Asad accordingly provided his input and requested JST to revise budget plan keeping in view of present market scenario.</p> <p><u>Energy efficiency bill</u></p> <p>Mr. Asad stated that energy efficiency & conservation bill 2015 could not be discussed in the Session of Parliament in this time because Minister for Water and Power did not participate due to his other commitment in Ministry of Defence. Further stated that Minister is having two charges of Ministries i.e. Ministry of Defence and MoWP. He hoped that this bill will now be placed and discussed in the upcoming Session of Parliament in the month of January, 2016. Further stated that once the bill is approved by National Assembly, it will be transmitted to Senate for their approval, thereafter it will be finally sent to President for his assent.</p> <p>After Presidential assent, it will become law in Pakistan. According to provisions of bill, there will be a National Energy Efficiency and Conservation Board to be established in the first meeting after enactment of bill. This board will further establish some committees, if requires, and will also meet the Task Force Members for further activities.</p> <p><u>Sharing of findings of JICA Survey Team with ENERCON.</u></p> <p>JICA Survey Team presented the findings of its survey and estimated outcomes that was appreciated by ENERCON. Mr. Asad requested JST for provision of softcopy of the presentation.</p>		