PART IV

CONCLSION AND RECOMMENDATION

Chapter 20

Conclusions

PART IV CONCLUSIONS AND RECOMMENDATIONS

20. Conclusions

20.1 Energy and Economic Situation and Policies

(1) *Affordability:* The economic growth of Jakarta area has been significant with the current average GRP per capita being about 3,000 US Dollars, a level perceived as sufficient to afford urban gas infrastructure. GRP per capita in other major metropolitan areas where gas is available is also growing fast and approaching the 1,000 US Dollar line. Perspective urban gas infrastructure in those areas will be worth consideration, too.

(2) *Gas Priority for Urban Use:* Urban gas priority is good to be built into the national energy policy at least in high growth metropolitan areas like Jakarta. Looking into the country's energy resource base available to domestic use and assuming abundance of natural gas in a long-term perspective, the gas could be best used for urban energy infrastructure. This is because a modern urban area requires a streamlined energy distribution contributing to better traffic conditions, better environment, more convenience, safety and higher energy efficiency, and the direct use of gas can meet such requirement. Other energy resources are better used by larger customers and in more rural areas.

(3) *Competition with LPG:* Gas networks can well compete with LPG at economic price levels. Since urban gas can be available only through pipeline systems that require large up-front costs, economics has to be carefully examined in view of affordability by people and competition with LPG. The use of LPG is rapidly growing in suburban areas and it is also a clean energy suitable for household use with care. Due to its safety and the nature of distribution system, however, it is more suitable for rural areas. Gas is preferred in urban areas.

(4) *Regulation and Policy:* There is almost no transparent framework yet to regulate urban gas distribution. Gas prices are set by the Government after discussions among PGN, Pertamina, MIGAS and political parties. By policy, the national one price system is applied so that the distributed gas has the same price throughout the nation if the use of gas is in a same category. While the constitution stipulates that gas and oil be marketed by a sate-owned company, but whether or not it governs the delivery to the end use is unclear. GOI well recognizes this situation and the need to formulate a streamlined framework as a prerequisite in inviting investors, it is drafting one with the help of ADB and WB.

With recognition that economic prices work best in a market economy, it is desired that as long as the pricing is reasonable in view of affordability, the efficiency cost and

competitiveness, price changes be approved smoothly under the transparent regulatory rules. Also in view of large up-front investment required, more a favorable tariff like a two part tariff system is desired to be employed for smaller customers.

While PGN is authorized as the sole gas distributor to smaller customers, some variations, like setting up a separate company for limited gas distribution, better be approved especially when one price policy rule is too rigid, a different system is economically justified and residents select such a different system.

(5) *Importance of Market Development*: While when it is a mandate to develop the domestic use of natural gas, more attention is usually paid to upstream development, it should be recognized that market development is equally important. When only large industries are a target such burden is small, but as the gas is to be used by a smaller but more abundant number of customers, large development effort and more intricate plans are necessary. Upstream and downstream have to be developed in parallel.

20.2 Assessment of Master Plan

(1) *Overall*: The Team concludes from the analysis of the Master Plan that the gas distribution to smaller customers is economically feasible and beneficial on the national economic basis. This is judged mainly from the overall EIRR and NSB over the calculation period from 1997 and 2020. The IRR and the NSB values of cash flows are shown in Table 20-1.

Table20-1 Economic Result of M/P

	IRR (%/y)	NSB (mil.Rp)
Base case	34.2	970,601
High case	40.2	1,353,508
Low case	28.1	653,777

Source: JICA Team 1997

We set gas prices at a level competitive with alternative energies in calculating IRR rather than directly determining the economic gas distribution cost in each market sector. There is complexity of the gas market that includes residential, commercial, industrial and new technology sub-sectors which all use the same distribution network. Instead, the residential gas distribution cost is exemplified in a feasibility study that follows later.

The feasibility is expected if:

- The price is set at a cost recoverable price, and
- is still at a level competitive with LPG,
- financing is available,
- all the effort to cut the cost
- large market as gas cooling is sought together.

(2) *Gas Purchase Price:* Before discussing gas sales prices, the gas purchase price was set to gradually increase from the current price of 167 Rp/m3 in 1996 to 268 Rp/m3 in 2020 in real terms reflecting the future gas to be coming from farther gas fields.

(3) *Residential:* The residential gas price was set at 800 Rp/m3 in real terms in the above economic analysis. This is a level still low enough to compete with LPG and to recover the investment; thus deemed as an economic price. The difference between the purchase price and 800 Rp/m3 represents the distribution cost which is based on efficient operations.

The set price of 800 Rp/m3 is far higher the current residential gas price but has to be realized for the independent feasibility of residential gas distribution. This level is both economically competitive and affordable by many potential customers.

A quick increase of the residential gas price to a level of 800 Rp/m3 is desired since a case of gradual increase in ten years proved not enough rate of return for inviting private sector investors.

(4) *Separate Entity:* How to virtually raise the price is a political or corporate theme and we have proposed a concept of "separate entity distribution operation". In this concept PGN sells gas to a separate distribution entity, PGN's subsidiary or a third party company, at a wholesale price and the rest of the work of gas distribution is handled by such an entity which charges an 800 Rp/m3 level price to residential customers in a designated area. This is because PGN is currently required by the Government to apply a unique gas price to residential customers in the country regardless of the region and actual cost differences, and it is presumed that a separate company may be allowed to apply a different but economically reasonable price to customers A similar scheme is already applied to apartment buildings, where a landowner charges a price to end customers, though the price is different from such a high level. To maintain the safety and common gas distribution standards, PGN may still act as a contractor for physical operations and patrols, not really feeling the loss of a market. The estate operator may be rewarded with certain economic return, keeping privilege and attractiveness of the property. By this scheme, the final price to the customer could be divided into a distribution charge and a gas price, the latter of which is still in line with the PGN gas tariff.

(5) *Financial Analysis:* Whether to adopt the separate entity concept and how quickly to raise the price for residential customers affect the economics of whole Master Plan mildly because of implicit cross subsidies from more lucrative industrial sectors. The situation is shown in Table 20-2. Since the portion of residential gas market in the whole PGN operations is small, the less economical element is well absorbed, except in the combined cases of current gas prices and low demand. This can work as a back-stop element to PGN for venturing into new market sectors, but it is never desirable that the residential gas market damage the financial picture of other sectors when PGN requires large investment in transmission lines. Thus an arrangement for self sustainability of the

residential gas operation is necessary.

(6) *Commercial Air-conditioning:* Gas absorption air-conditioning is mostly feasible in commercial facilities at the current gas and electric prices if the pipelines are located close to the customer facilities. The estimated pay-back is 3 to 4 years. Assuming the electric prices will be raised in the future reflecting the clearly more expensive generation costs, absorption chillers will be feasible in the future, too.

Table 20-2 Financial Analysis on the Master Plan

	Scenario		Base		High		Low	
			IRR %/y	NPV milRp	IRR %/y	NPV milRp	IRR %/y	NPV milRp
1	Managed by separate utility. Gas purchased at 315, sold at 800	PGN side	27.0	432,524	31.5	727,665	20.8	194,685
		Sep. U.	17.5	120,337	17.9	130,940	17.0	106,697
2	PGN operates. Price up in ten years		20.7	456,244	24.5	769,704	16.1	203,656
3	PGN operates. No price hike		16.6	259,105	21.2	574,686	10.4	8,837

Source: JICA Team 1997

(7) *Cogeneration:* High efficiency cogeneration may have some difficulty in attracting investors, who generally want a quick property investment return, due to high capital expenditure and generally low energy prices as well as insufficient amount of heat demand depending on facilities. Pay-back is 5 to 6 years and the IRR may be in the range of 10 to 13 %/y in a 15 year project period. It is still economical to an investor with enough financial capability and long-term perspective of property investment. It is worth consideration to hotels and hospitals in urban areas. The gas cogeneration is challenged by another cogeneration using low priced oil products without environmental restriction in urban areas.

(8) *NGV:* An NGV is simply beneficial for environment in urban areas as long as economics allows it and the policy of the government to spread CNG for taxis, buses and other fleet are appreciated if the price of a conversion kit is maintained at the current level and safety is ensured. There are still barriers of land prices in installing CNG filling stations in urban areas and so the economics is difficult to generalize. Certain density of the number of stations are required for NGVs to take off in a self sustaining market. It may be worth certain cross-subsidy in a transition period.

(9) *Industrial market:* There is a large potential in industrial gas market in many industrial estates being developed in the east of Jakarta as well as in Serang. Uncertainty is also large in estimating the potential gas demand since many estates are in very early stage of development. The Team, nevertheless dared to approximate the potential. There are recently challenges from low cost oil products, so PGN should feel competition and think in advance for possible demand areas. The Team appreciates that PGN well knows about the industrial gas sector from abundant experiences.

(10) *Environmental and societal effect:* The Team conducted a detail environmental assessment for the Master Plan projections. As gas is good only, it is essentially to assess how good natural gas is in urban areas. Gas considerably decreases SOx and NOx in urban areas by replacing oil for factories as well as greenhouse gases effective globally. Gas absorption chillers decreases ozone depleting CFCs. The gas is safer than LPG which has recently caused many large explosion incidents as well as more convenient. It is felt by people as having a premium value which, though, changes with income levels and hard to quantitatively determine.

20.3 Conclusions from Feasibility Studies

Table 20-3Financial Results of Feasibility Studies

No.	Scenario		Bekasi		BSD			
					100% Progress		50% Progress	
			IRR %/y	NPV mil Rp	IRR %/y	NPV mil Rp	IRR %/y	NPV mil Rp
1	Operated by separate utility. Gas sold at 800 Rp, purchased at 315 Rp/m3	PGN	15.2	403	94.7	16,886	40.6	6,509
		S. Ut.	14.5	1,971	22.7	13,786	21.2	12,027
2	PGN operates. Up to 800 Rp in 10 yrs.		7.3	-1,722	17.4	10,203	8.6	-1,932
3	PGN operates. Price remains w/o hike.			-7,824	10.3	304		-11,832
4	PGN operates. Gov. help pipes; no price hike.			-4,613	38.0	11,701	8.5	-777
5	PGN operates. Gov. help pipes; To 800 in 10 yrs.		13.6	1,489	52.5	21,600	24.1	9,122

Source: JICA Team

(1) The Team has confirmed the economic feasibility of gas distribution to smaller customers under certain conditions in two estates: Perum Perumnas Bumi Bekasi Baru and Bumi Serpong Damai. The former is almost purely residential and the latter is the combination of large commercial center and residential estates. Another distinction is that the former is a government sponsored estate while the latter is very large and purely a private sector estate. Table 20-3 shows the results.

(2) *Bumi Bekasi*: The results on Bumi Bekasi Baru shows a typical genuine residential gas distribution which has proved rather tough economics. It is economically feasible if:

- the gas price is raised to 800 Rp/m3 from the beginning, and
- the operation cost is kept minimum by only a limited number of staff and workers.

(3) *Separate entity*: Assuming the difficulty in raising the gas price directly by PGN, the Team considers the case of a "separate entity" is the only possibility, in which a gas bill to a customer is broken down into a gas charge and distribution service charge.

PGN has enough return by whole-selling the gas to a separate gas distributor at 315 Rp/m3 applying the current K2 tariff in line with the size of the demand from Bekasi.

Based on our financial analysis on PGN's profitability, PGN will even be able to give a discount in the whole-sale price to such an entity or establish a new and lower tariff table, attracting more customers in the estate.

Responsibilities should be clearly defined in such a separate entity gas operation since it is matter of fact a joint distribution operation. Our analysis assumed PGN invest in all high pressure gas mains above 3 bars, all regulators from the main and a gas meter for the whole sale gas transfer. PGN also takes care of the patrolling over low pressure lines. We assumed these be included in the wholesale price. Measure for gas leaks, if found, is a responsibility of the entity.

Safety is very important to assure the customers and for sustaining the business for long time and it is for this reason that PGN is expected to assume patrolling the low pressure pipelines since it is more experienced than a new entity which may be only financially interested in the residential gas distribution.

(4) *Responsibility of PGN:* By keeping the high pressure mains as PGN's property, PGN can expand its own service area through the estate to other larger customers, since PGN is basically given the right of a natural monopoly.

The price to existing residential gas customers will have to be gradually increased to eventually match the level at those estates. Since a tariff system more honest to the real cost levels should be recognized as a fair system, we hope it will be accepted.

PGN should be able to invest in such a separate entity, but considering the regulation by PKLN which restricts foreign investment in RI's governmental entities, PGN's share may be well restricted to a small level for quick implementation. Such consideration enables pipeline investment to be smoother.

(5) BSD: BSD is characterized by large commercial facilities as well as the residential sectors and the overall economics is much better than Bekasi. The same discussions as in Bekasi can go for residential part of the estate but when the separate entity handles both commercial and residential districts in the estate as is expected the performance of the entity of BSD will be more attractive due to large demand for gas from air-conditioning if properly installed. Our Study has been focused only on the eastern half of the estate divided by a river, which suggests that the study will be a good indication to the future development of the western half.

(6) *Gradual development of commercial facilities:* The prospect of a gas air conditioning market is heavily affected by the commercial facility build-up progress. Performance is best when all facilities are starting at the same time (defined as 100% Progress in Table 20-3) but such is unlikely. With a more conservative build-up progress (say, 50% in 5 years), however, the economics will be still attractive.

(7) *District cooling:* District cooling has an economic possibility in BSD because of sizable accumulation of cold heat demand in a central area of commercial facilities. A

more centralized energy system, it increases the energy efficiency, convenience, safety, smartness and privilege, and saves space in buildings. Premium values due to those factors, however, are felt differently according to the people and income levels generally. Because of higher up-front costs of the system, than for decentralized systems, the decision will rest with the land developers on whether to take long-term or short-term advantages.

20.4 Utility Management

(1) Financial and market status: While PGN has successfully expanded gas distribution to industrial customers so far, further expansion of the entity is to involve enormous investment in high pressure and long haul transmission pipelines, drastically changing its financial status. Future projects are very large compared to the size of the current PGN and large borrowings are envisaged as well as inviting equity investors. Still the Debt/Equity ratio is expected to increase. When the ratio of Cost of Goods/ Total Sales and Profit/Total Sales are decreasing these years, each new project should be very carefully examined of the feasibility and maximum efforts must be devoted to securing the market and cutting the cost by further efficient operations.

Since these projects are national dream projects which are important for the national policy to promote the domestic gas use to replace oil, the government is expected to fully support the projects, subject to PGN's own effort as the major transmission and distribution company.

A Market oriented approach will be more necessary in the future to secure the market, since without the market there will be no new pipelines and that means more efforts and expertise required. All possibilities of the market especially in the Jakarta areas will have to be explored and examined. For further expansion, a smaller customer market will have to be explored, too, with more carefulness.

(2) Organization and human resource development: Restructuring of organization in PGN is actively going on to adapt to new business status for the future. PGN has successfully expanded the business without any large increase in the number of employees in the last decade. Further expansion, however, may require involving more people in and out of the company with higher expertise because a more diversified gas market development is required. It will be necessary to involve and organize more outside contractors, to further develop our own human resources for higher expertise and to promote and cultivate more team-work among the employees to exploit every employee for common targets.

For the Master Plan to be implemented, additional functions will have to be added to the organization, various gas sales promotion techniques have to be learned, safety standards have to be streamlined and more system development will be necessary to handle more customers and to control gas networks more efficiently.

(3) Gas pricing: This Study finds that current gas price level is insufficient to target smaller customer market except for gas air-conditioning and any measures to virtually increase the price within an economically justified range. It is also desired to restructure the tariff system to adapt to the new markets mainly to more easily recover the investment costs by adopting a two-part tariff system or any other comparable system. To continuously study into the tariff system will be necessary as all gas companies in the world do to cope with the changing world.

(4) Gas Networks: Through detail network analyses, the Study finds many bottlenecks existing in the gas distribution networks as PGN recognizes, too. Most problems will be solved by precisely locating those problems and by small additional investment. Some problems, however, appear to exist in between PGN and Pertamina, since the high pressure transmission line and distribution network is closely linked. In this regard, close talks and cooperation with Pertamina will be desired.

To cope with expanding gas networks, more technologies will have to be introduced without too much dependence on labor force in the future. The Study finds that personnel expenses are already becoming a heavier burden in the distribution costs with the increase of a per-head income due to the economic growth and so personnel expenses.

(5) *Marketing:* Future marketing to target new smaller customer markets requires more a diversified approach to various potential customers, like, land developers, building owners, architects and gas appliance sellers. New strategies to diversified markets will have to be gradually developed to implement the Master Plan.

Chapter 21

Recommendations

21. Recommendations

(1) Policy Level:

1) The government should recognize in its policy that the Jakarta area can already afford to have urban gas infrastructure due to its economic strength while such development has been inhibited by low gas prices.

2) The government policy is recommended to put a high priority in urban gas for a streamlined urban energy infrastructure.

3) The policy should recognize that gas can have a competitive price with that of LPG, and gas is more suitable for urban residents and LPG is an important fuel for more rural areas for the residential purpose.

4) Regulatory framework should allow the prices to be at a level to recover the justifiable costs for urban gas infrastructure. The two-part tariff system which is more appropriate in recovering the investment cost, should be considered. Efficient gas pricing based on economic costs and prices should be more easily approved in the approval process.

5) The policy makers should recognize that market development is important equally to upstream development to promote domestic gas use.

(2) Master Plan:

1) It should be recognized that gas distribution to smaller customer market is feasible at economic prices under certain conditions including joint development of residential and commercial, and gas cooling market. Mid-income group residents can be better targeted for the residential gas market and so they can be a locomotive for building up of the gas energy infrastructure.

2) When the distribution cost in certain region is different from other region and such cost can still compete with other fuels, it is recommended to approve a mechanism to apply a different price through a separate entity establishment

3) The government is recommended to endorse the promotion of gas air-conditioning and cogeneration, when feasible, for commercial buildings and complexes.

4) NGVs are beneficial and recommended to be promoted in the urban areas. More filling stations are necessary for sustainability.

5) It is recommended to continue to watch new industrial estate development, since industrial estates in West Java are growing and early pipeline planning is better for securing the gas market.

(3) Feasibility Studies:

1) We recommend that a policy of gas price increase or of establishing a separate utility for gas distribution, which is granted to apply separate tariffs, be established early especially for Bekasi. While gas distribution is economically feasible in Bekasi, subject to economic gas tariff of 800 Rp/m3, any lower price may inhibit development, since it is a purely residential estate, without commercial customers.

2) BSD is highly encouraging for gas distribution to the combination of residential and commercial customers and so we recommend that an agreement among relevant organizations be reached early.

(4) Gas Utility Management:

1) We recommend that human resource development in strategic areas for market development be effectively promoted.

2) PGN is recommended to lead improved tariff system development to facilitate to more quickly recover the investment cost.

3) We recommend to solve the bottlenecks of gas networks for future gas expansion.

4) More cooperation between Pertamina and PGN recommended to optimize the gas network operation.

5) More technology to be introduced because the burden of personnel expense is rising as is seen in the analysis of the distribution costs in Feasibility Studies.

Chapter 22

Next Steps

22. Next Steps

22.1 Immediate Future:

This Study includes recommendations involving policy changes both at national and PGN levels which are a prerequisite for implementation of the Master Plan and other plans from feasibility studies. Establishing policies or a direction of policies on gas prices and PGN's policies for organizational and managerial improvement will be crucial for future steps from this Study.

All projections and analyses in this Study assume that such policy changes be made in a year of 1997 and implementation begin in 1998. A delay of a year in policy formulations means one year delay of all plans in this Study.

22.2 For implementation:

There are still more steps to be followed after the final report is approved until implementation, if implementation is decided.

a. Clearing government policies and regulations
b. Establish the direction for gas prices
c. Gas purchase arrangement
d. Acquiring supervising consultants
e. Establishing company policies
f. Establishing concrete rolling plans
g. Revised and finalized feasibility studies for financial institutions
h. Financing arrangement
i. Establishing work forces
j. Education and training for employees and contractors
k. Adjusting with gas appliance manufactures and sellers
l. Procurement procedures

Table 22-1 Implementation Schedule

	First Year		2		3	4
	1 st.	2 nd.	1 st.	2 nd.		
1. Clearing Government Policies and Regulations						
Establishing the Direction for Gas Prices	← →					
Establishing Separate Company Policies	← →					
2. Gas Purchase Arrangement	← →					
3. Acquiring Supervising Consultant	←	—	—	→		
4. Establishing Concrete Rolling Plans	←	→				
5. Revised and Finalized Feasibility Studies		← →				
6. Financing Arrangement			← →			
7. Establishing Work Forces		←	—	—	—	→
8. Procurement Procedures						
Drafting Specifications for Tenders		← →				
Reviewing Tenders			←	→		
9. Preparation of Converting Appliances in to Natural Gas						
Adjusting with Gas Appliance Manufactures			← →			
10. Detail Designing Gas Facilities				← →		
11. Education and Training for Employees and Contractors			←	— →		
12. Implementation				←	—	→

Chapter 23

Acknowledgment

23. Acknowledgment

The Team thanks all the officials who joined in, contributed to or cooperated with the Team in conducting the Study. Such officials and organizations are recorded in a list elsewhere in this report for commemoration.

Part V

APPENDICES

TABLE OF CONTENTS

A. Quality of Gas and Other Fuels

Quality of Gas and Other Fuels

1. Natural Gas

The property of natural gas that PGN distributes is generally of high grade while the thermal (or calorific) value differs from branch to branch due to differences in gas composition. In the Jakarta area, the calorific value of gas is defined normally as 8,800 kcal/m3 (36.84 MJ/m3) at 27 degrees Celsius (deg C). The gas used in the Cirebon area, however, includes much carbon dioxide (CO2) and the value is accordingly lower.

PGN as such usually quotes the thermal values at its standard temperature of 27 deg C. This standard compares with 60 deg F (Fahrenheit) or 15.5 deg C in the US, 15 deg C in Europe and 0 deg C in Japan. On gas purchasing side, however, PGN uses Pertamina's international, i.e., American petroleum industry's, standard, and is therefore familiar to the unit of Btu/scf at 15.5 deg C (60 degF) for the thermal value. The "Btu" represents British thermal unit and "scf" standard cubic foot.

The properties of sampled gases is calculated in Table APX1-1. The table shows that calorific values of the gas in the Jakarta area are close to the standard 8800 kcal/m3 at 27 deg C or a little less. The substantially high thermal value of gas in Medan area and the low value in Cirebon are also shown in the table for reference. Standard thermal values set in kcal/m3 are 11,000 for Medan, 7,200 for Cirebon and 9,100 for Surabaya.

Table APP 1-1 Property of PGN Gas

		Jakarta & Bogor			for Reference		
	Location	average	Serpong	Tegal Gede	Surabaya	Cirebon	Medan
	Sample date	10/95	1/23/95	1/25/95	10/95	10/95	10/95
Composition:	Components	%	%	%	%	%	%
	N2	1.39	0.232	0.69	1.67	2.48	0.26
	CO2	1.38	0.695	1.222	2.66	26.62	1.02
	CH4	93.3	97.251	95.768	88.52	61.61	78.19
	C2H6	3.55	0.925	1.239	3.79	6.49	10.41
	C3H8	0.19	0.573	0.563	2.04	3.04	6.03
	iC4H10	0.06	0.11	0.206	0.36	0.57	1.63
	nC4H10	0.08	0.162	0.194	0.5	0.61	1.5
	iC5H12	0.03	0.032	0.068	0.15	0.38	0.56
	nC5H12	0.02	0.019	0.05	0.12	0.2	0.32
	nC6H14+	0	0	0	0.19	0	0.06
Quality	Total	100	100	100	100	100	100
Rgd	20deg						
Specific gravity:	SpGr	0.595	0.578	0.589	0.645	0.906	0.743
Calorific values:							
kcal/m3 (gross)	HCV 27 degC	8,716	8,779	8,755	9,035	7,212	10,856
kcal/Nm3 (gross)	HCV 0 degC	9,586	9,655	9,629	9,937	7,932	11,947
Btu/scf (gross 60 F)	HCV Btu/scf	1,019	1,026	1,024	1,056	843	1,270
MJ/m3(gross,27degC)	HCV MJ/m3	36.48	36.75	36.65	37.82	30.19	45.44
kcal/m3 (net, 27 degC)	LCV 27 degC	7,864	7,918	7,898	8,166	6,534	9,858
Other values:							
Flame velocity (CP)	FSCP	39.30	39.83	39.24	38.34	25.27	41.49
Wobbe number kcal/Nm3	Wobbe	12,415	12,704	12,543	12,373	8,331	13,859
kcal per weight (gross)	HCV kcal/kg	12,476	12,918	12,629	11,923	6,777	12,486
Density	D kg/m3	0.705	0.679	0.693	0.758	1.065	0.873

JICA 1997; gas composition: PGN *Note: HCV=gross (higher) calorific value; LCV= net (lower) calorific value*

The gas is processed by international standards and impurities are controlled in Pertamina facilities according to a MIGAS document not cited here. PGN gas is odorized with tetra-hydrothiophene (THT) injected at the rate of 16 mg/m3 at city gates. The appropriateness of the olfactory intensity is discussed in the text of the Report.

2. Other Fuels

Thermal values of competing fuels are defined by the Government mainly for statistical purposes. Table APX 1-2 shows those values from MIGAS in 1995 which are extracted from PGN's "Konversi Satuan", an excellently edited document of unit

conversion tables. We had some reservation on the thermal value of LPG in the document, which we used our discretion to revise in this table.

Table APX 1-2 Standard Thermal Values of Fuels in Indonesia

Name of fuel		Thermal value	
(Indonesian)	(English)	kcal	per unit
Fuel Oil:			
Avgas	aviation gasoline	8,087	liter
Avtur	jet fuel	9,245	liter
Mogas, premium	gasoline	8,424	liter
Kerosin, M. Tanah	kerosene	9,040	liter
ADO, HSD, M. Solar	Diesel	9,440	liter
IDO, M. Diesel	industrial Diesel oil	9,440	liter
IFO, M. Bakar	fuel oil, bunker C	9,942	liter
Coal:			
rata-rata	average	6,000	kg
PLN	steam coal for PLN	6,600	kg
LPG:			
LPG Propan	propane	12,000	kg
LPG Butan	butane	11,800	kg
	average	11,900	kg

Source: PGN except for LPG

3. LPG Value

Among confusions about thermal value of LPG butane which was referred to as 11,200 kcal/kg in some local literature, the Team obtained the data of Arjuna LPG from PGN as a sample. The compositions of the LPG are shown in Table APP 1-3 as well as calculated properties. The property of butane is thus confirmed normal and the value is 11,800 kcal/kg.

Table APP 1-3 Property of Arjuna LPG

	Composition %	LPG Propane	LPG Butane
	N2	0	0
	CO2	0	0
	CH4	0	0
	C2H6	0.84	0
	C3H8	97.66	0.02
	iC4H10	1.38	34.99
	nC4H10	0.12	46.22
	iC5H12	0	10.35
	nC5H12	0	5.92
	eC6H14+	0	2.5
	Total	100	100
Property	Code		
Specific gravity	SpGr	1.554	2.162
HCVkcal/m3 at 27 C	HCV 27dC	21,937	29,846
HCV at 0 degC	HCV/Nm3	24,251	33,264
HCV per kg	HCVkg	12,031	11,800
in Btu/scf 60F	HCVscf	2,570	3,509

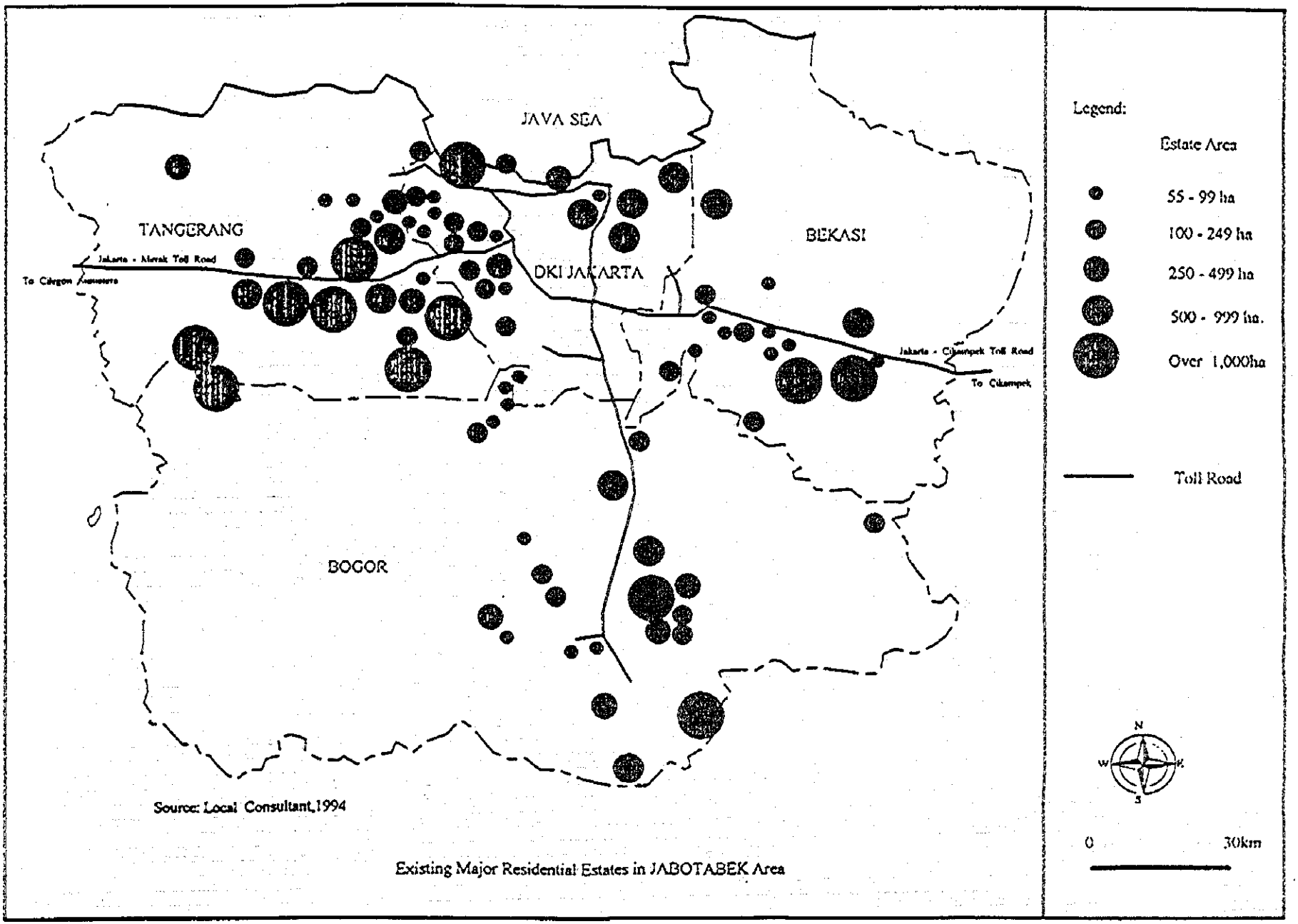
Note) HCV: Gross (higher) calorific value

Source: JICA Team: Composition from PGN December 1996

4. Other Issue

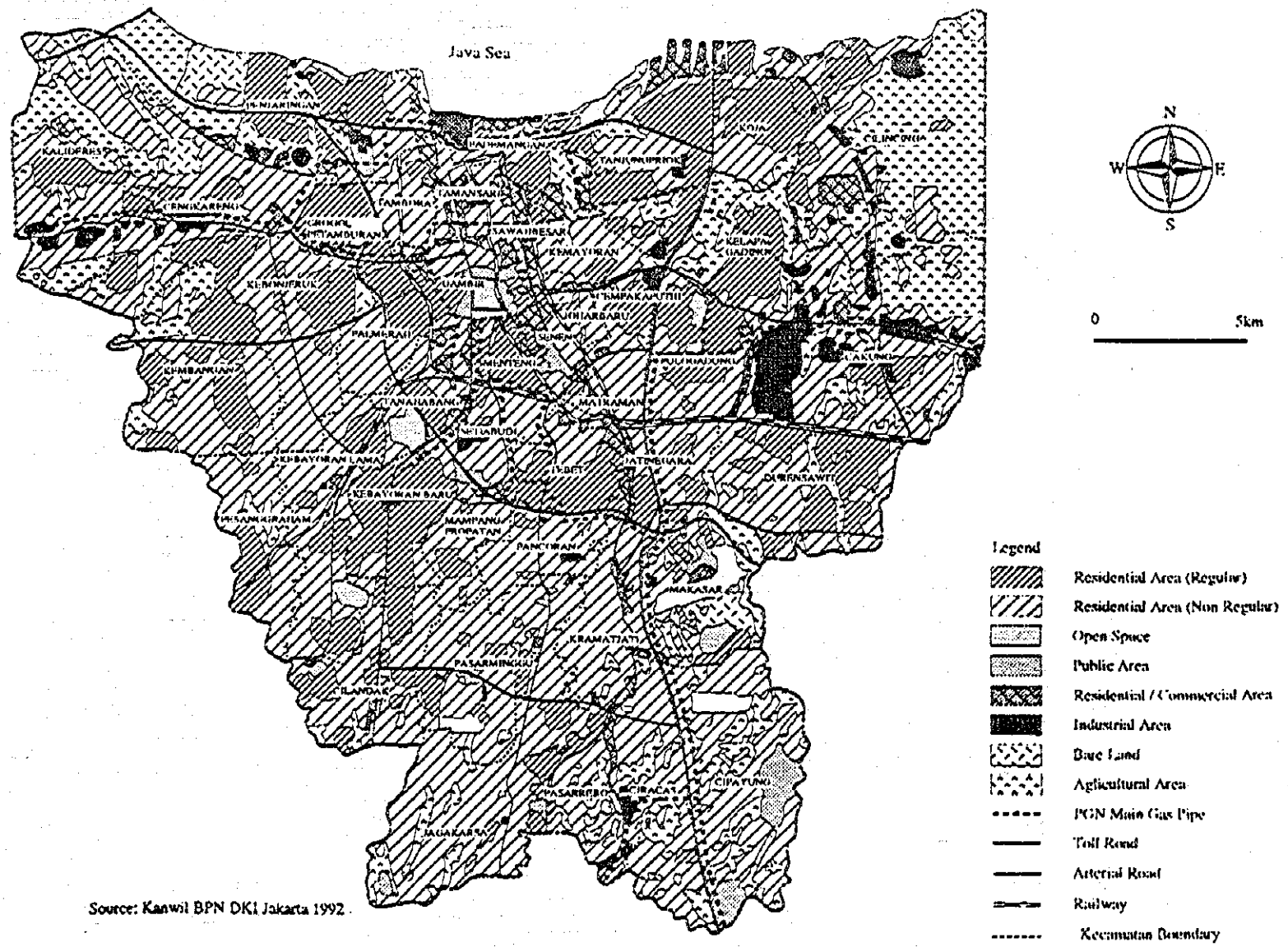
We take gross (higher) calorific values for energy value conversion among competing fuels in most cases while there is debate that net (lower) thermal values should be used for such a purpose especially in the residential market sector. Such statement is theoretically true if latent heat can never be used, which, though, is now untrue where very efficient condensing water-heaters could be used in some OECD countries.

B. Urban Development

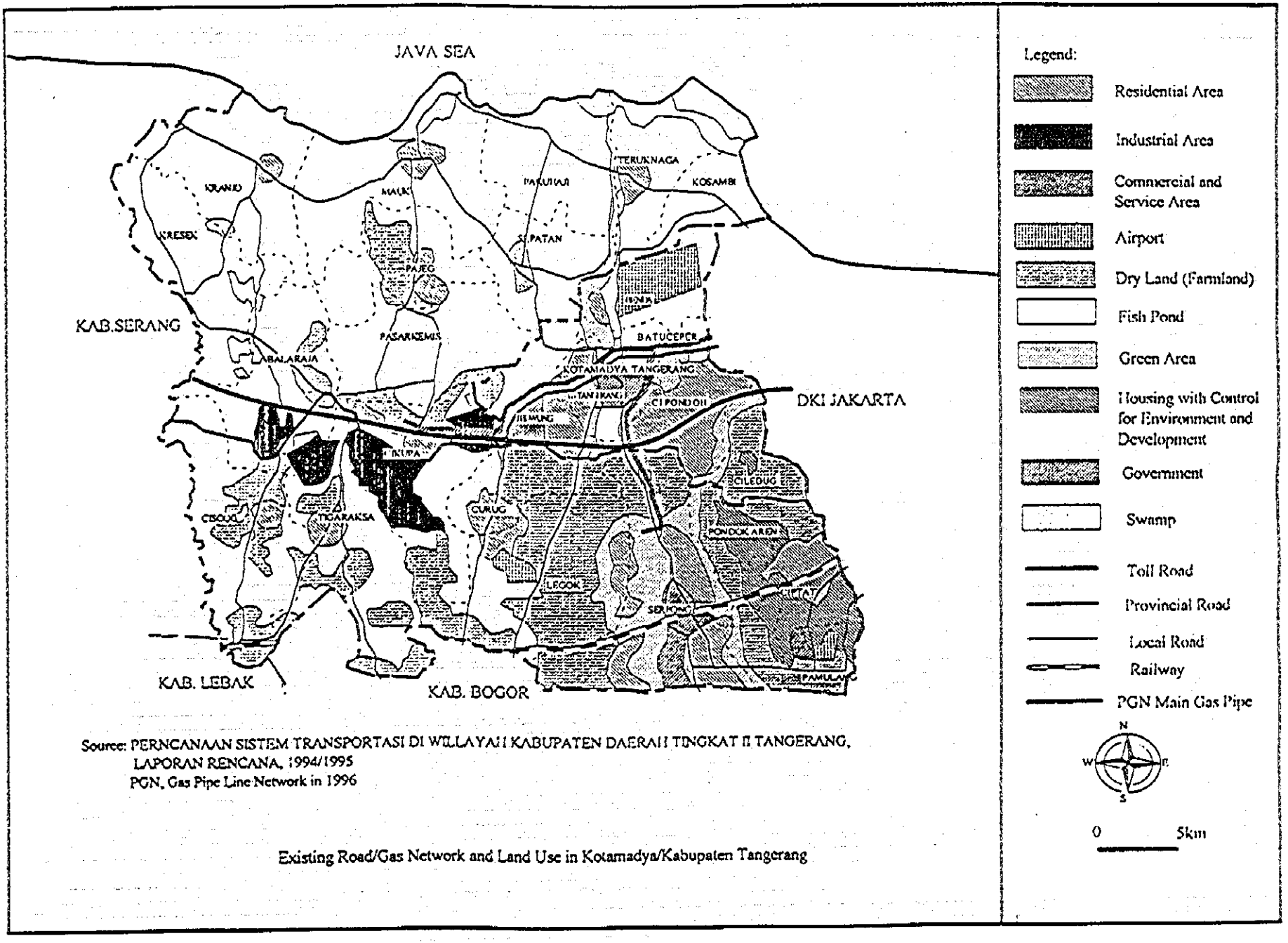


Source: Local Consultant,1994

Existing Major Residential Estates in JABOTABEK Area

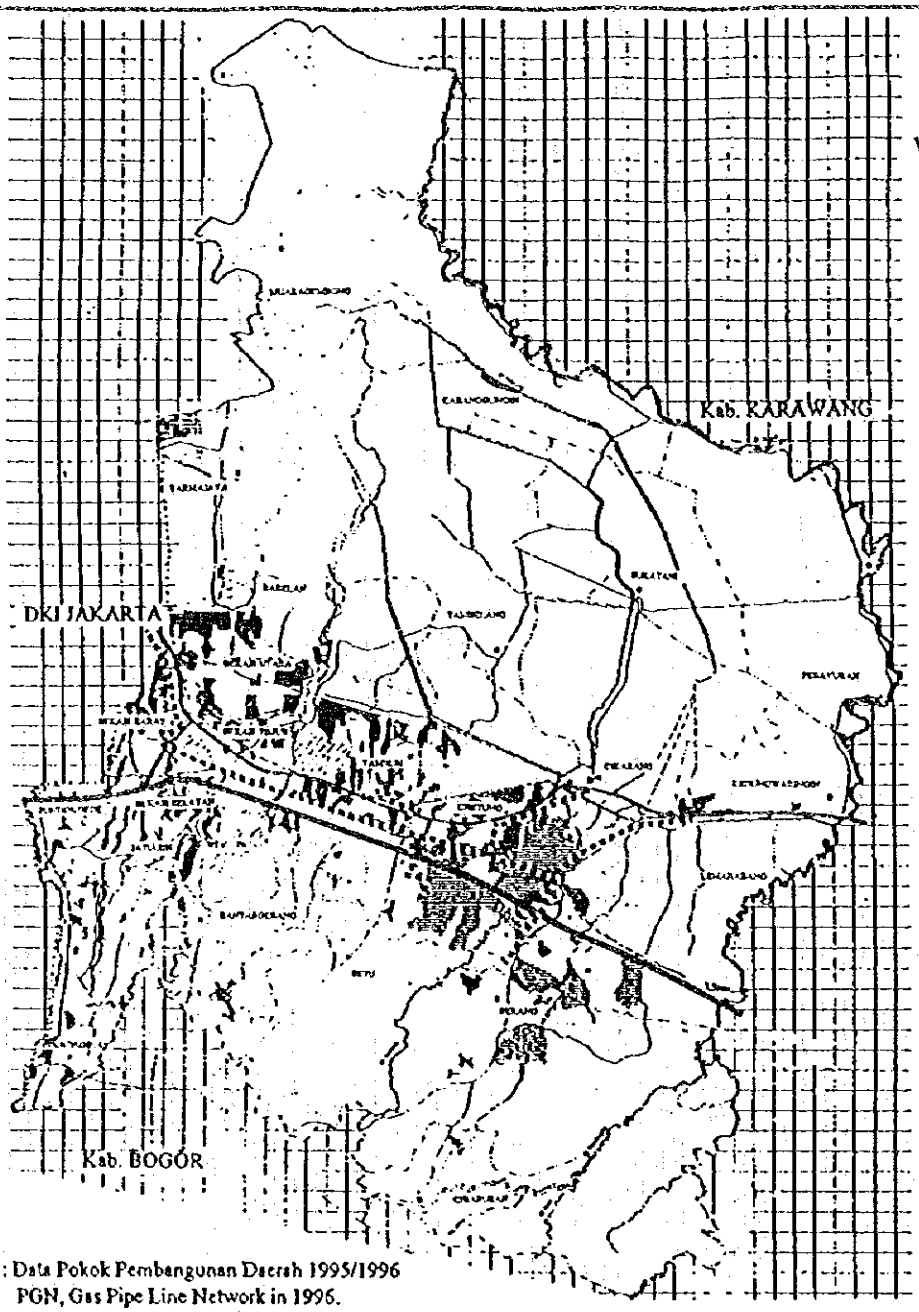


Existing Land Use and Road / Gas Network



Source: PERNCANAAN SISTEM TRANSPORTASI DI WILLAYAH KABUPATEN DAERAH TINGKAT II TANGERANG, LAPORAN RENCANA, 1994/1995
PGN, Gas Pipe Line Network in 1996

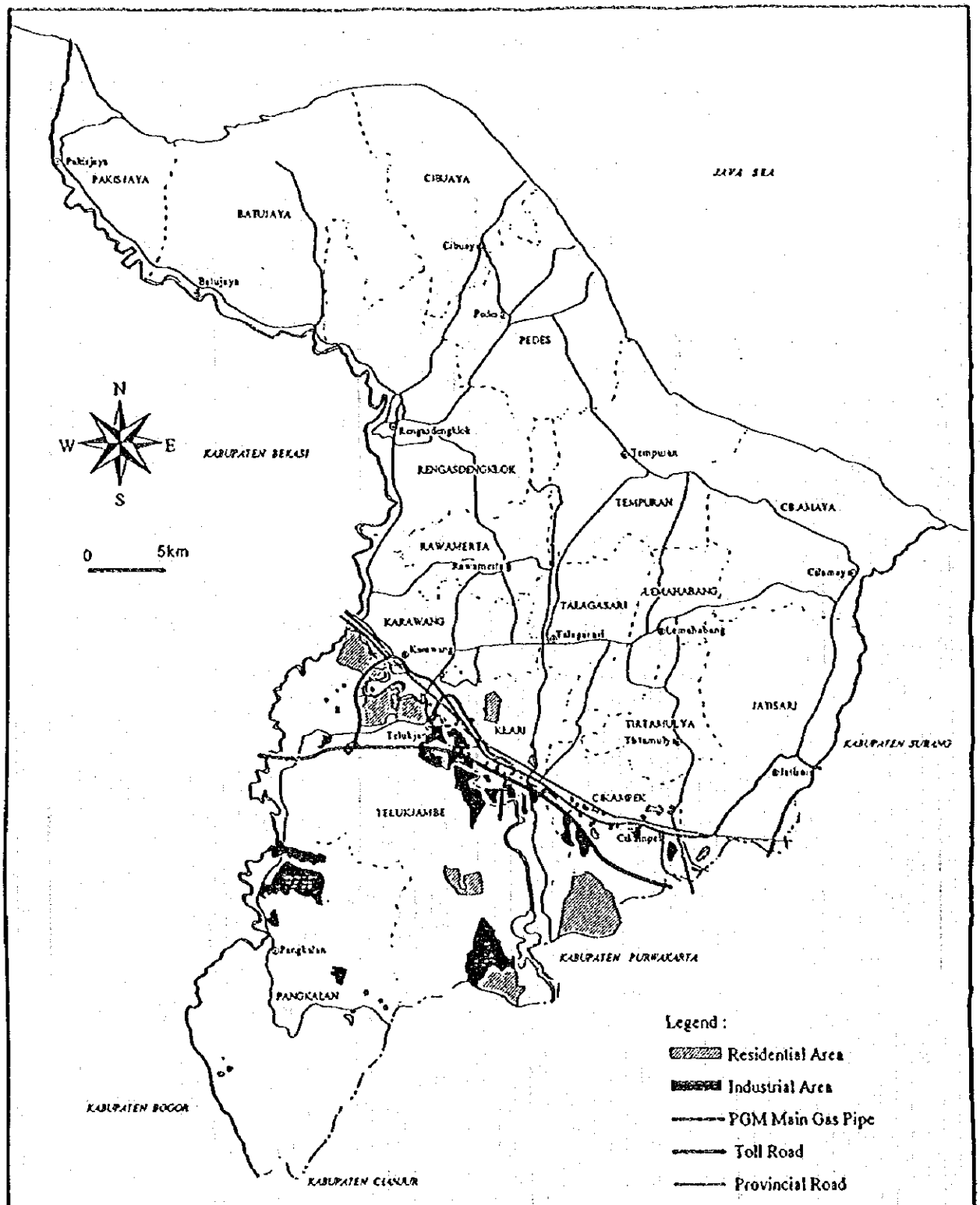
Existing Road/Gas Network and Land Use in Kotamadya/Kabupaten Tangerang



Source : Data Pokok Pembangunan Daerah 1995/1996
PGN, Gas Pipe Line Network in 1996.

- Residential Area
- Public Residential Area
- Large Scale Residential Estate
- Industrial Area
- Industrial Park
- Lumber Company
- Cargo Terminal
- Golf
- PGM Main Gas Pipe
- Toll Road
- Provincial Road

Existing Residential/Industrial Area and Road,/Gas Network in Kabupaten Bekasi



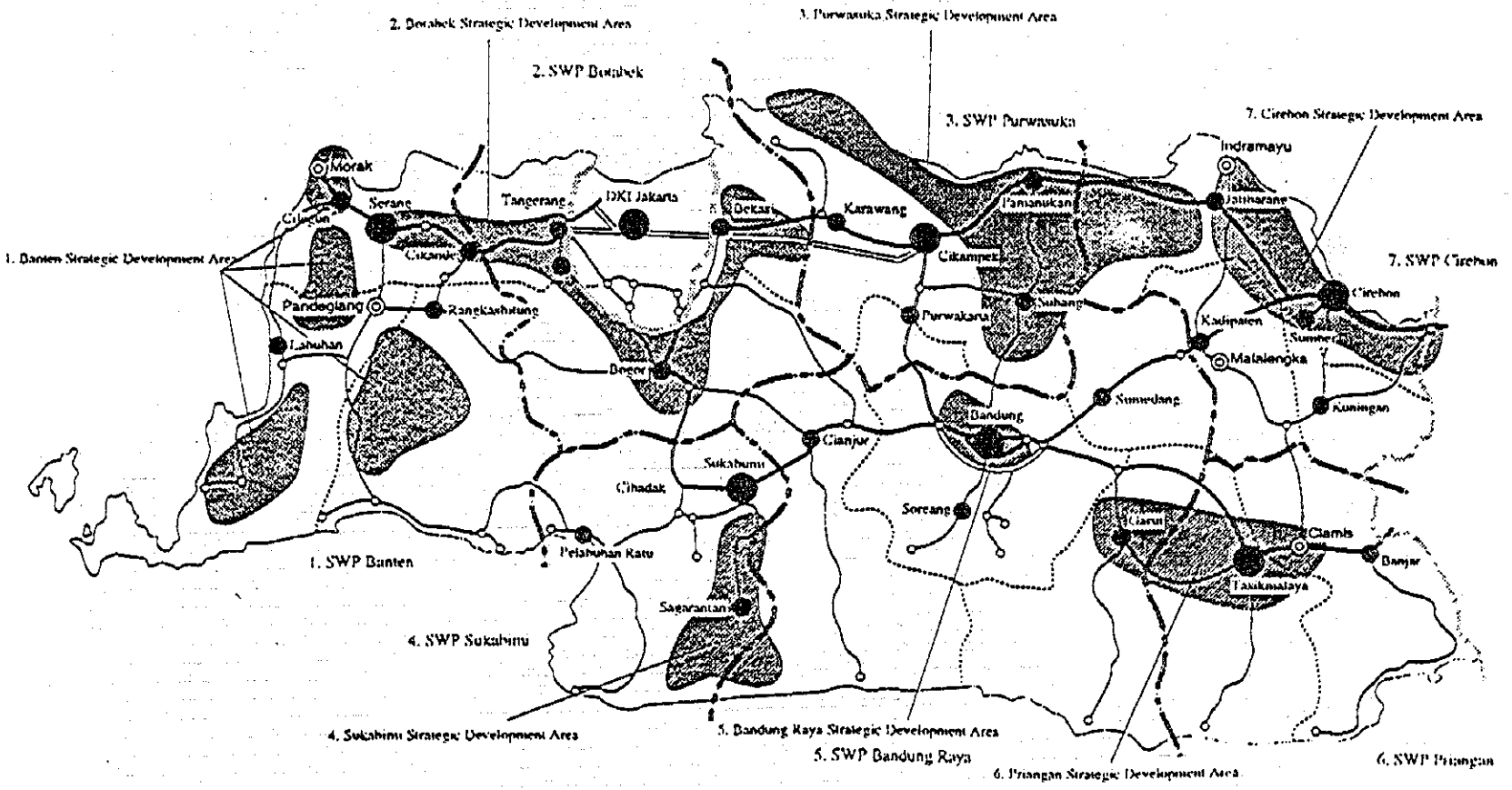
Source : Kabupaten KARAWANG BAPPEDA, Land Use.
PGN, Gas Pipe Line Network in 1996.

Existing Residential/Industrial Area and Road,/Gas Networks in Kabupaten Karawang

Strategic Development Area and Future City Hierarchy

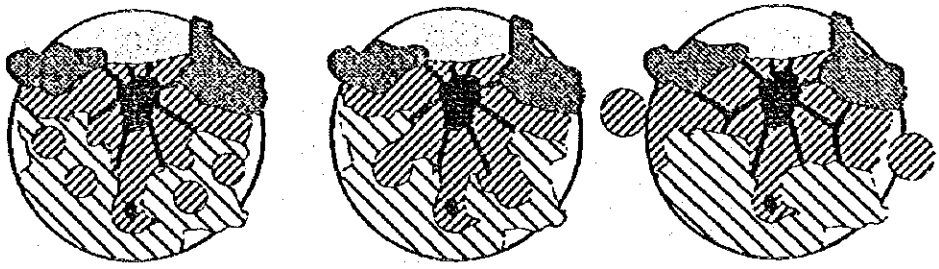
Strategic Development Area		City Hierarchy in 2010		
Area Name	Potential Industory	SWP Name	Order I	Order II
1.Banten (3,500 ha)	Plantation (Rubber Plantation and Large Estates) Forestry Tourism Large and Medium Scale Manufacturing Mininig and Quarrying	1.Banten	Serang (Goverment Administration Center)	Cilegon (Trading, Services, Industry Center) Labuhan Rangkasbitung Cikande
2.Botabek (7,000 ha)	Plantation (Large Estates) Mininig and Quarrying Large and Medium Scale Manufacturing	2.Botabek	DKI Jakarta*	Bogor Bekasi Tangerang Serpong
3.Purwasuka (15,600 ha)	Agriculture (Food Crops) Large Estates and Public Estates Forestry Mining and Quarring Tourism Large and Medium Scale Manufacturing	3.Purwasuka	Cikampek	Karawang Subang Purwakarta Pamanukan
4.Sukabimi	Agriculture (Food Crops) Plantation Forestry Mining and Quarring Small Scale Manufacturing and Home Industry Turism	4.Sukabimi	Sukabumi	Cibadak Pelabuhan Ratu Sagarantan
5.Bandung Raya (1,000 ha)	Plantation (Large Estates and Public Estate) Forestry Mining and Quarring Turism	5.Bandung Raya	Bandung	Garut Sumedang Cianjur Soreang
6.Priangan	Agriculture (Food Crops) Mining and Quarring Turism	6.Priangan	Tasikmalaya	Banjar
7.Cirebon	Agriculture (Food Crops) Public Estates Forestry Mining and Quarring	7.Cirebon	Cirebon	Sumber Jatibarang Kadipaten Kuningan

NOTE: * DKI Jakarta is not included in SWP Botabek



Source : LAPORAN KONSOLIDASI DAN RENCANA STRUCTUR TATA RUANG PROPINSI JAWA BARAT, 1992

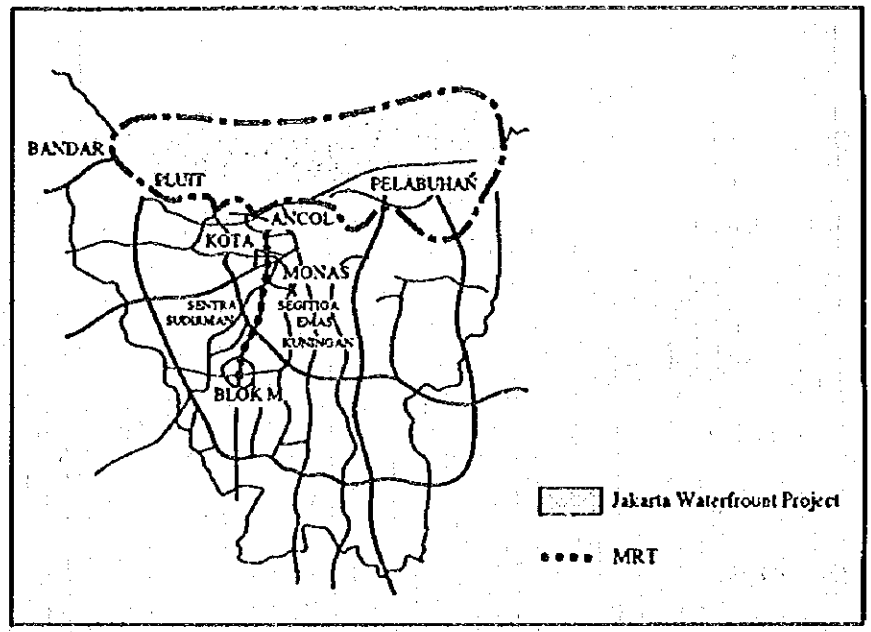
Strategic Development Area and Future City Hierarchy



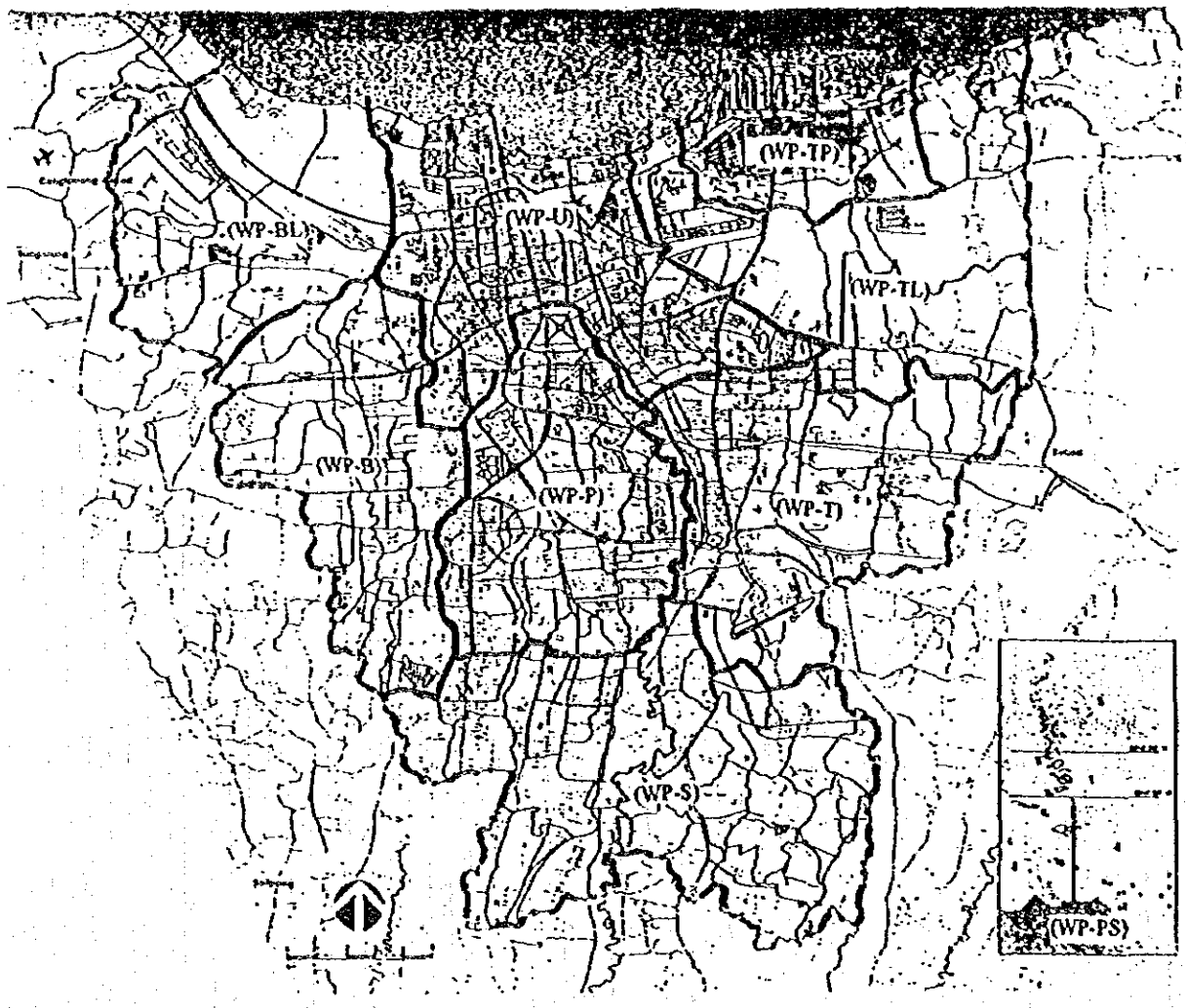
SELF SUSTAINING NEW TOWNS FINGER CITY LINEAR CITY

Source : JABOTABEK METROPOLITAN DEVELOPMENT PLAN REVIEW, 1993

Urban Development Paradigms

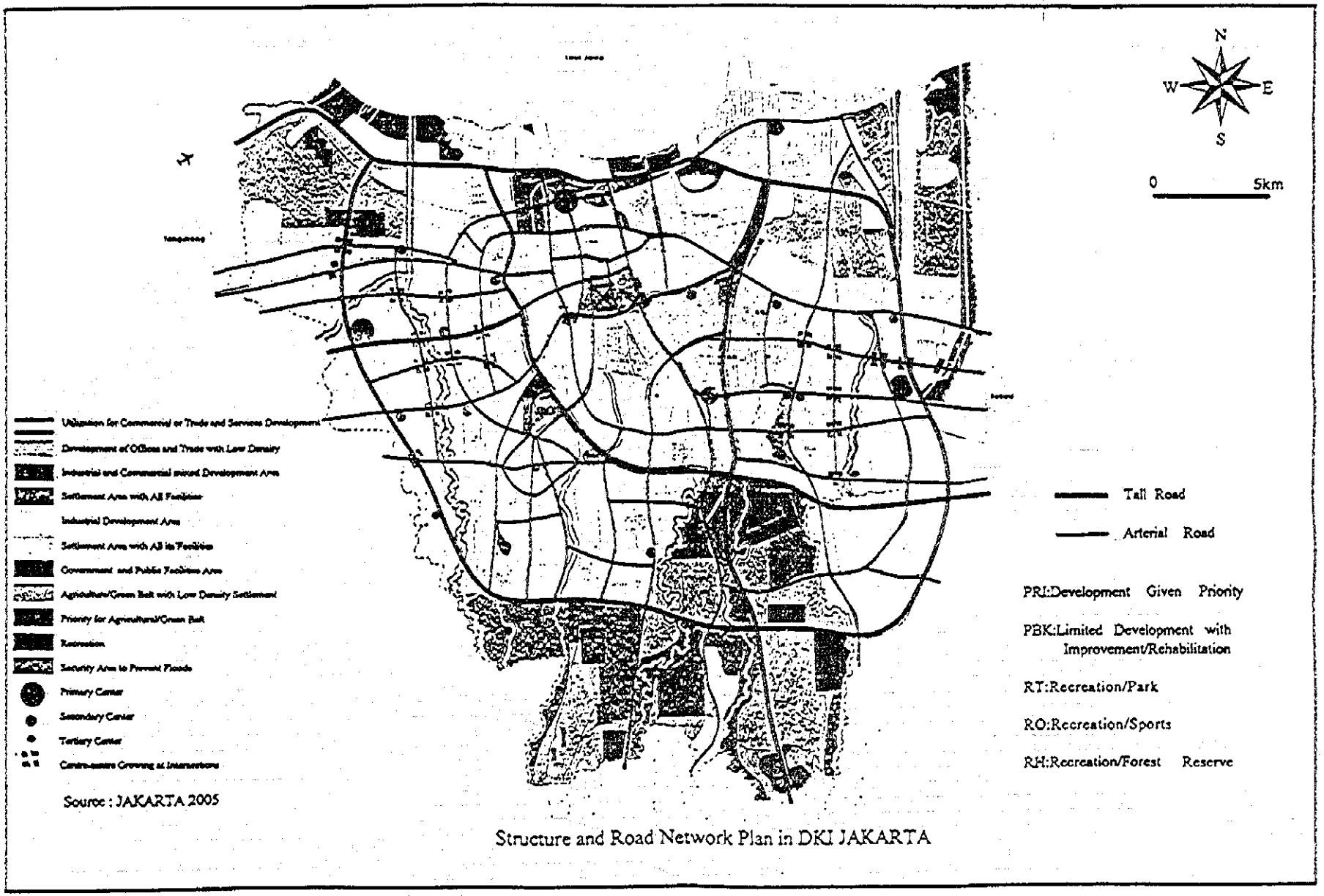


Projects Location

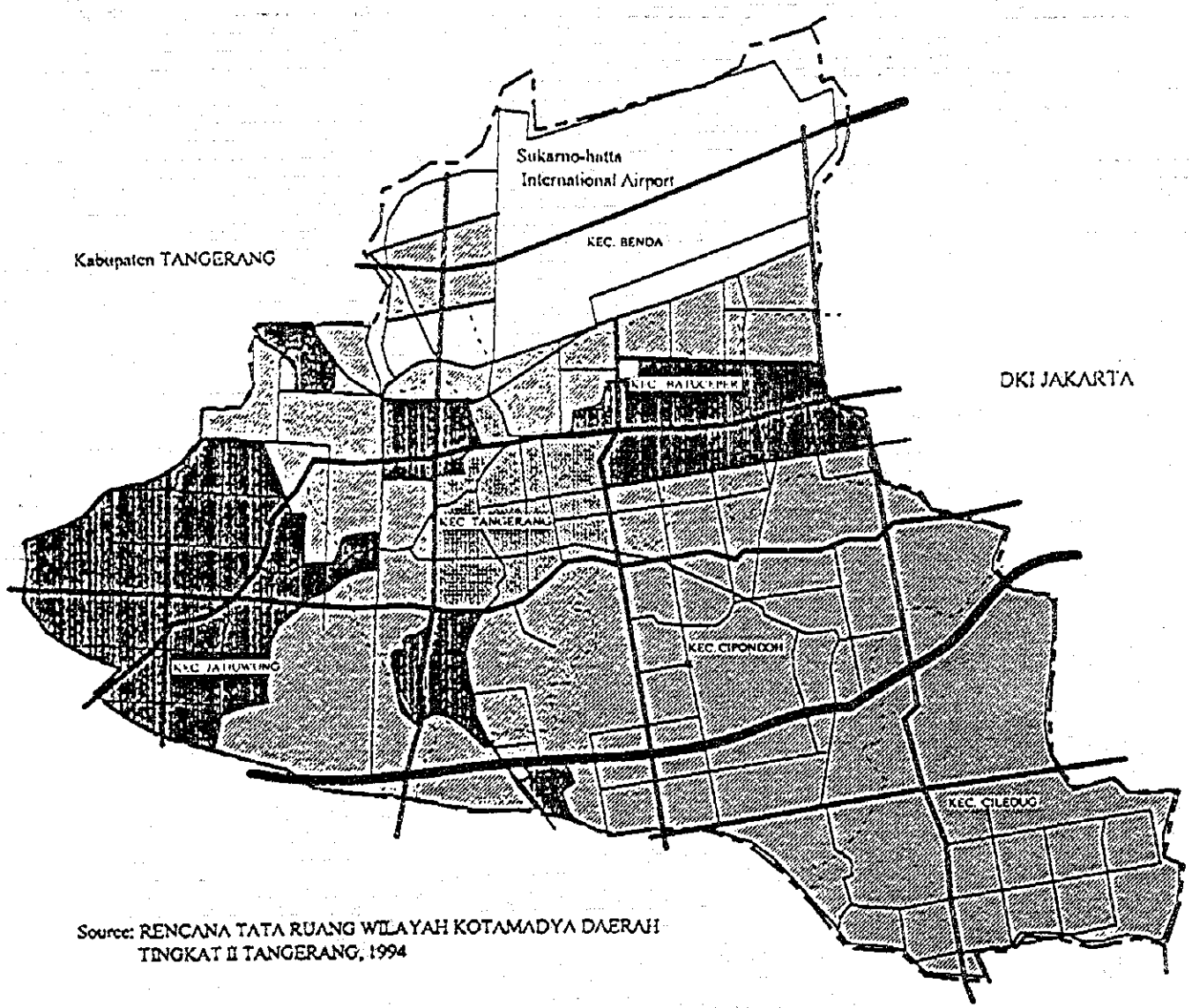


Source : JAKARTA 2005, 1990

Development Planning Zones

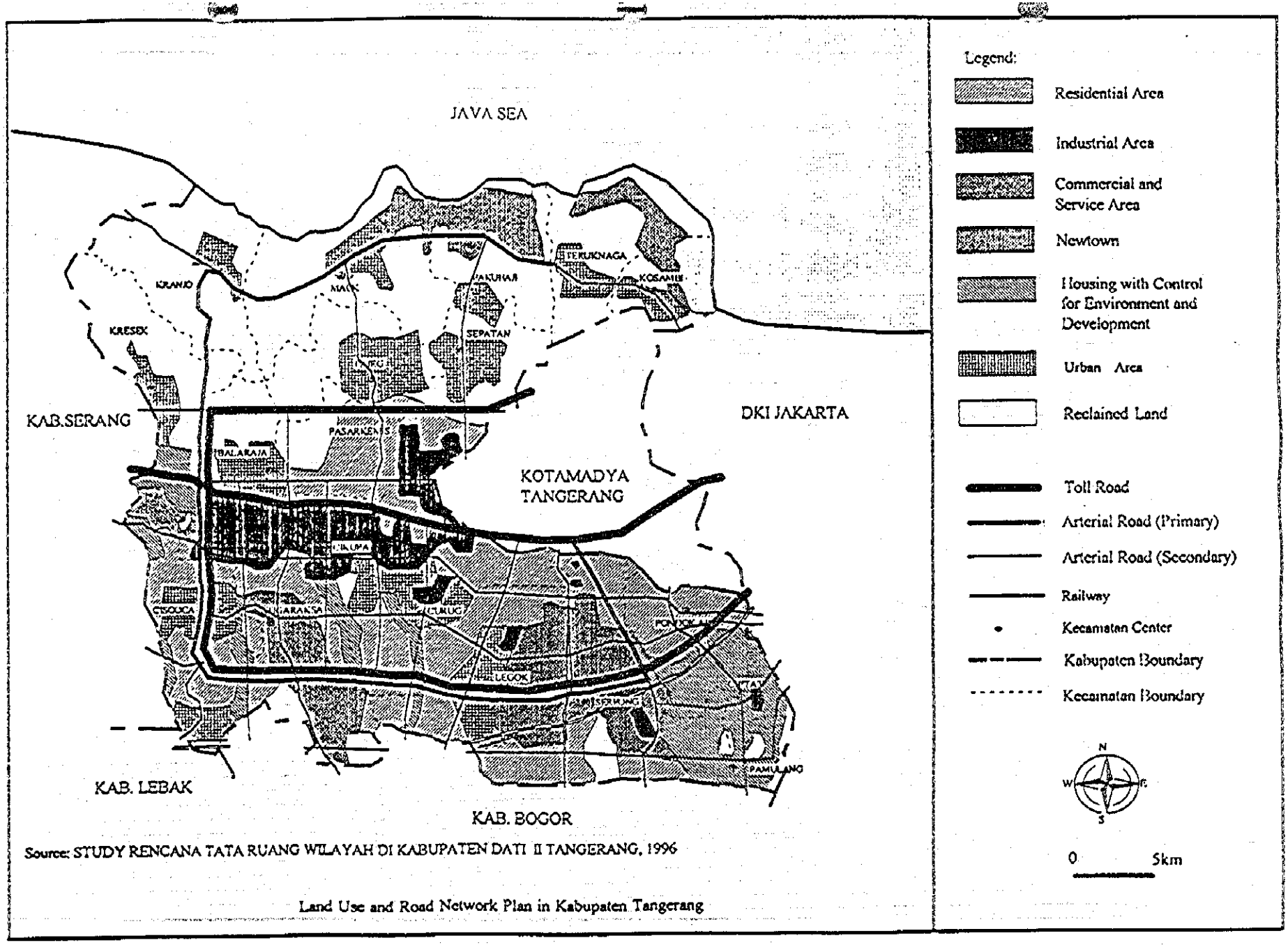


Structure and Road Network Plan in DKI JAKARTA



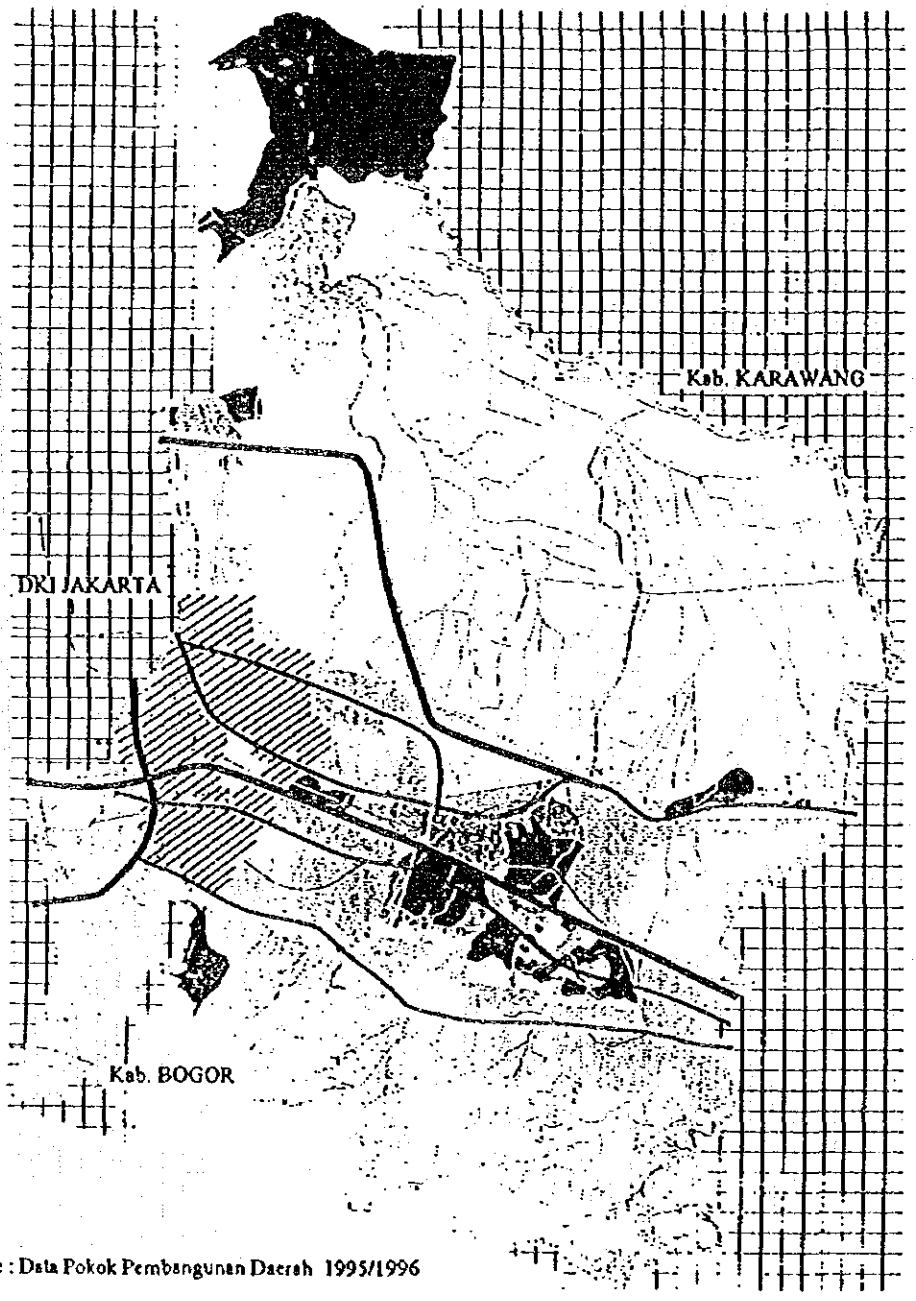
Source: RENCANA TATA RUANG WILAYAH KOTAMADYA DAERAH TINGKAT II TANGERANG, 1994

Land Use and Road Network Plan in Kotamadya Tangerang



Source: STUDY RENCANA TATA RUANG WILAYAH DI KABUPATEN DATI II TANGERANG, 1996

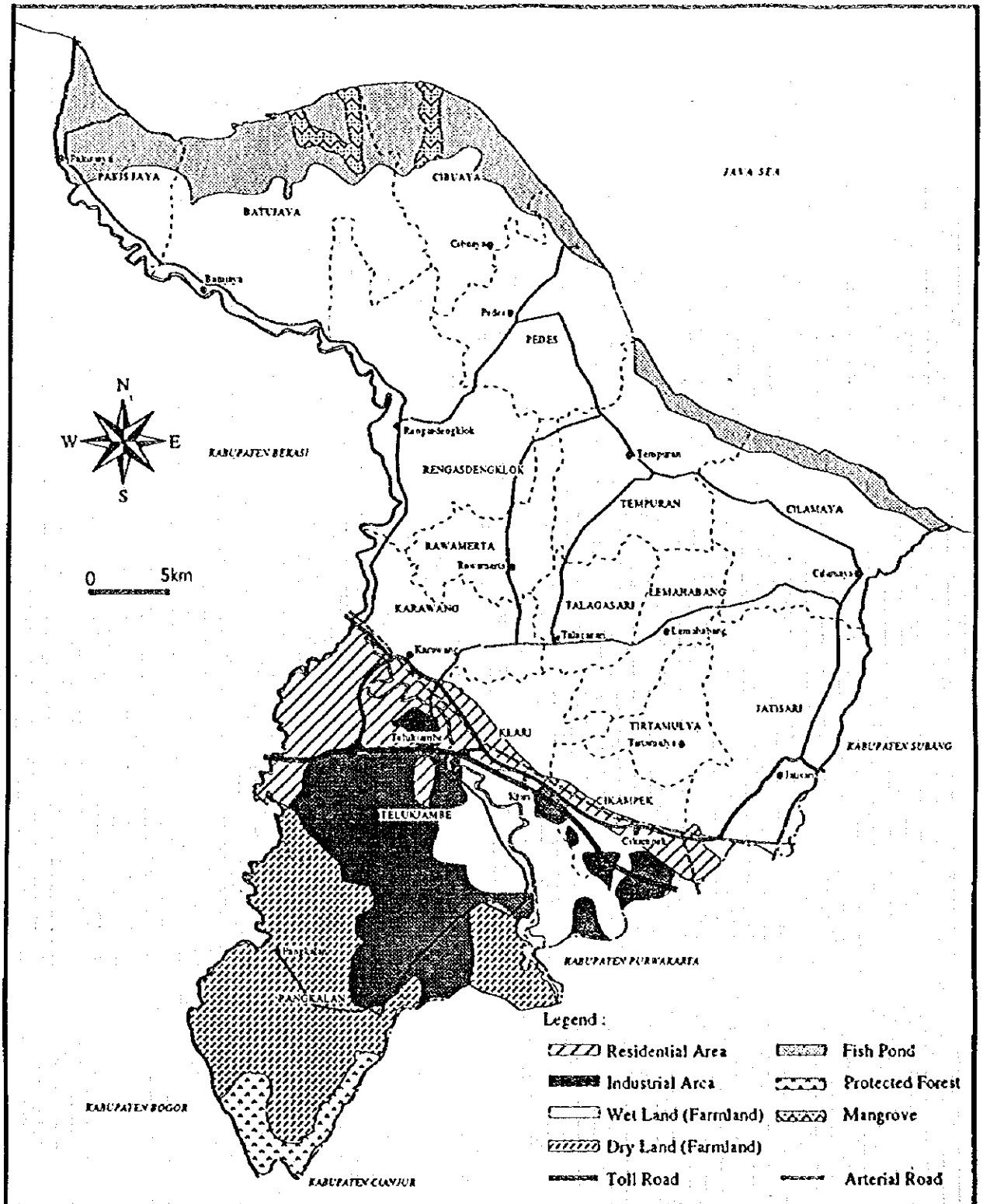
Land Use and Road Network Plan in Kabupaten Tangerang



Source : Data Pokok Pembangunan Daerah 1995/1996

- Residential Area
- Residential Area (Expanding)
- Industrial Area
- Industrial Park
- Recreation
- Service Center
- Urban Area (Kotip Bekasi)
- Protected Forest
- Dry Land (Farmland)
- Wet Land (Farmland)
- Fish Pond
- Green Area
- Toll Road
- Arterial Road

Land Use and Road Network Plan in Kabupaten Bekasi



Source : RENCANA TATA RUANG WILAYAH KABUPATEN DAERAH TINKAT II KARAWANG

Land Use and Road Network Plan in Kabupaten Karawang

C. Residential Demand Projection

Questionnaire for energy consumption in residential sector

1. Name (head of household)			
2. Address/location		Tel	
3. Education (head of household)	1 University 4 Never attended school	2 High school	3 Elementary school
4. Occupation (head of household)	1 Company employee 4 Student	2 Official 5 Jobless	3 Self-business
5. Salary (Rp)/Month (Summary of family)	1 Rp.200000 4 Rp.1000000-50000(	2 Rp.200000-400000 5 Rp.>5000000	3 Rp500000-1000000
6. Fuel cost per month	( ) Rupia		
7. Family members	( ) persons		
8. Living home status	1 Own 4 Company	2 Contract 5 Rent	3 Government 6 other
9. Physical building	1 Single building 3 Apartment 4 Other	2 Single building with more than one floor 4 Cooperation use	
10. Kitchen location from the nearest street	1 Along the street 4 30m	2 10m 5 Other	3 20m
11. Building utilization	1 Only for living	2 Living and working	
12. Appliances used			
Electricity Monthly consumption kWh/m Rp/m	1 Electric stove 4 Electric Iron 7 Refrigerator 10 Washing machine 13 Video 16 Others(	2 Rice cooker 5 Color TV 8 Air condition 11 Lamp 14 Fan)	3 Electric Oven 6 B/W TV 9 Water heater 12 Radio/type record 15 Toaster
City Gas Nm3/m Rp/m	1 Gas stove 4 Others(	2 Oven)	3 Water heater
LPG kg/m Rp/m	1 Gas stove 4 Others(	2 Oven)	3 Water heater
Kerosene l/m Rp/m	1 Stove 4 Others(	2 Lamp)	3
Fuelwood kg/m Rp/m	1 Stove 4 Others(	2)	3
Coal kg/m Rp/m	1 Stove 4 Others(	2)	3
13. Cooking time/day	1 30 Minute 4 more then 2 hours	2 1 hour	3 1.5 hours
14. Cooking time for dinn	1 4 o'clock PM 4 7 o'clock PM	2 5 o'clock PM 5 8 o'clock PM	3 6 o'clock PM 6 Other
15. Shower time/week using hot water	1 7 times 4 3 times 7 Other	2 6 times 5 2 times	3 4 times 6 1 times
16. If you do not use city gas, what are the principal reason: 1 City gas is not yet available 3 City gas is too expensive 5 Others( )		2 Equipment cost is too expensive 4 Do not prefer city gas for cooking	

Sample Characteristics

Number of Sampled Households by Income Level and Occupation of Head of Household

Income (Rp)	Company employe	Official	Self business	Student	Jobless	Missing	Total
<200,000	64	26	32	2	1		125
200,001-400,000	116	80	56		1	2	255
400,001-1,000,000	172	26	59	1		1	259
1,000,000-5,000,000	200	20	61		1	1	283
>5,000,000	17	13	33				63
missing	36	1	9	6		9	61
Total	605	166	250	9	3	13	1046

Source: Questionnaire Survey by JICA Team 1996

Percentage Distribution of Interview Survey by Income Group

Monthly Income per Households(Rp)	Number	Share
< 200,000	125	12%
200,000-400,000	255	24%
400,000-1,000,000	259	25%
1,000,000-5,000,000	283	27%
> 5,000,000	63	6%
Missing	61	6%
Total	1,046	100%

Source: Questionnaire Survey by JICA Team 1996

Percentage Distribution of Interview Survey by Income Group and Population

Monthly Income per Households(Rp)	Population	Share
< 200,000	550	12.10%
200,000-400,000	1,122	24.68%
400,000-1,000,000	1,039	22.85%
1,000,000-5,000,000	1,257	27.64%
> 5,000,000	337	7.41%
Missing	242	5.32%
Total	4,547	100.00%

Source: Questionnaire Survey by JICA Team 1996

Average Family Size of Interview Survey by Income Group

Monthly Income per Households(Rp)	Family Size (Not Including Staff)
< 200,000	4.37
200,000-400,000	4.40
400,000-1,000,000	4.01
1,000,000-5,000,000	4.47
> 5,000,000	5.35
Average	4.52

Source: Questionnaire Survey by JICA Team 1996

Monthly Energy Consumption per Household and per Capita

Income Group	LPG		Kerosene		City Gas		Electricity	Energy Consumption per Capita (kcal/C)	Electricity Consumption per Capita (kWh/C)
	kcal	kg	kcal	ltr	kcal	M3	kWh		
Very Low Income	168,912	15.05	239,075	27.04	200,444	22.78	121	52,888	32
Low Income	211,547	18.85	312,483	35.35	177,499	20.17	158	55,299	36
Middle Income	215,144	19.18	316,251	35.78	242,978	27.61	291	66,442	82
High Income	324,057	28.88	150,556	17.03	176,000	20.00	903	74,627	199
Very High Income	406,258	36.21	88,400	10.00	543,889	61.81	1,649	78,356	297

Source: Questionnaire Survey by JICA Team 1996

Note: Very Low Income : <200,000Rp per month

Low Income: >200,000Rp and <400,000Rp per month

Middle Income: >400,000Rp and <1,000,000Rp per month

High Income: >1,000,000Rp and <5,000,000Rp per month

Very High Income: >5,000,000Rp per month

Percentage of Ownership of Selected Electric Appliances by Income Group

Item	Very Low Income		Low Income		Middle Income		High Income		Very High Income	
	Ownership	%	Ownership	%	Ownership	%	Ownership	%	Ownership	%
Rice Cooker	19	15.08	50	19.5	92	35.52	80	28.27	21	33.33
Oven	2	1.59	15	5.84	20	7.72	35	12.37	11	17.46
Iron	106	84.13	237	92.22	230	88.8	248	87.63	53	84.13
Color TV	102	80.95	243	94.55	230	88.8	262	92.58	59	93.65
Refrigerator	52	41.27	159	61.87	211	81.47	264	93.29	57	90.48
Air Condition	5	3.97	25	9.7	67	25.87	164	57.95	45	71.43
Water Heater	0	0	5	1.94	21	8.11	30	10.60	24	38.09
Washing Machine	18	14.29	44	17.12	92	35.52	153	54.06	35	55.56
Lamp	125	99.2	254	98.83	259	100	283	100.00	63	100.00
Tape Record	73	57.94	158	61.48	177	68.34	215	75.97	48	76.19
Video	5	3.97	20	7.78	53	20.46	167	59.01	37	58.73
Fan	82	65.08	199	77.43	129	49.81	174	61.48	39	61.90
Toaster	2	1.58	2	0.78	17	6.56	18	6.36	7	11.11

Source: Questionnaire Survey by JICA Team 1996

Note: Very Low Income : <200,000Rp per month

Low Income: >200,000Rp and <400,000Rp per month

Middle Income: >400,000Rp and <1,000,000Rp per month

High Income: >1,000,000Rp and <5,000,000Rp per month

Very High Income: >5,000,000Rp per month

Questionnaire for interview survey

1. Which fuels were used and how mach were used in this household during the past month

City gas	_____	M3	_____	Rp
LPG	_____	kg	_____	Rp
Electricity	_____	kWh	_____	Rp
Kerosene	_____	ltr	_____	Rp
Fuelwood	_____	kg	_____	Rp
Charcoal	_____	kg	_____	Rp
Other	_____	kg	_____	Rp

2. What are the principal reason if the answer of question is do not use city gas

a. City gas supply is not yet available ☐
b. Equipment cost is too expensive ☐
c. City gas is to expensive ☐
d. Do not prefer city gas for cooking ☐
e. Afraid it would cause fires ☐
f. Others ☐

2.1 Would you want to use city gas if the answer of question is city gas is not yet available

_____ Yes _____ No

2.2 How mach could you accept if the answer of question is equipment cost is too expensive

_____ Rp

2.3 How mach could you accept if the answer of question is city gas is too expensive

_____ Rp/ltr

2.4 What is the reason you do not prefer city gas for cooking if the answer of question is do not prefer city gas for cooking

3. Why do you use LPG if the answer of question is use LPG

a. It is easy to get LPG _____
b. LPG is cheaper then other fuels _____
c. Cooking with LPG is faster _____
d. LPG does not make utensils dirty _____
e. It was already installed before he or she lived in this house _____

3.1 when did you start using LPG _____

3.2 The LPG is used for: Cooking _____ Boiling water _____
Lighting _____ Others _____

3.3 Do you want change LPG with city gas if available

a. Yes _____
b. Yes, if it is cheaper then LPG _____
c. Yes, if the equipment is not expensive _____
d. No _____
e. No, it is same as LPG _____

3.4 Do you want change LPG with other fuels

a. Yes, because it is too expensive _____
b. No _____

Questionnaire for interview survey
continue

4. Why do you use kerosene if the answer of question is use kerosene
   a. It is easy to get kerosene _____
   b. Kerosene is cheaper then other fuels _____
   c. Cooking with kerosene is easy _____
   d. Kerosene does not make utensils dirty _____
   e. others _____

4.1 When did you start using kerosene _____

4.2 The kerosene is used for: Cooking _____ Boiling water _____
Lighting _____ Others _____

4.3 Do you want change kerosene with city gas if available
   a. Yes _____
   b. Yes, if it is cheaper then kerosene _____
   c. Yes, if the equipment is not expensive _____
   d. No _____
   e. No, it is same as kerosene _____

4.4 Do you want change kerosene with other fuels
   a. Yes, because it is too slowly _____
   b. No _____

5. Why do you use city gas if the answer of question is use city gas
   a. It is easier to get city gas _____
   b. City gas is cheaper then other fuels _____
   c. Cooking with city gas is faster _____
   d. City gas does not dirty _____
   e. The city gas network was already connected _____

5.1 when did you start using city gas _____

5.2 The city gas is used for: Cooking _____ Boiling water _____
Lighting _____ Others _____

5.3 Do you want change city gas with LPG
   a. Yes _____
   b. Yes, if it is cheaper then city gas _____
   c. Yes, if the equipment is not expensive _____
   d. No _____
   e. No, it is same as city gas _____

5.4 Do you want change city gas with other fuels
   a. Yes, because it is too expensive _____
   b. No _____

Interview

Sample Characteristics

Number of Sampled Households by Income Level and Occupation of Head of Household

Income (Rp)	Company employee	Official	Self business	Student	Jobless	Total
<200,000	7	3	8	1		19
200,001-400,000	24	35	16			75
400,001-1,000,000	37	14	10			61
1,000,000-5,000,000	14	6	5			25
>5,000,000	9	11	7			27
Total	91	69	46	1		207

Source: Interview Survey by JICA Team 1996

Percentage Distribution of Interview Survey by Income Group

Monthly Income per Households(Rp)	Number	Share
< 200,000	19	9%
200,000-400,000	75	36%
400,000-1,000,000	61	29%
1,000,000-5,000,000	25	12%
> 5,000,000	27	13%
Total	207	100%

Source: Interview Survey by JICA Team 1996

Percentage Distribution of Interview Survey by Income Group and Population

Monthly Income per Households(Rp)	Population	Share
< 200,000	93	9.69%
200,000-400,000	346	36.04%
400,000-1,000,000	276	28.75%
1,000,000-5,000,000	105	10.94%
> 5,000,000	140	14.58%
Total	960	100%

Source: Interview Survey by JICA Team 1996

Average Family Size of Interview Survey by Income Group

Monthly Income per Households(Rp)	Family Size (Not Including Staff)	Family Size (Including Staff)
< 200,000	4.89	4.89
200,000-400,000	4.61	4.69
400,000-1,000,000	4.52	4.75
1,000,000-5,000,000	4.2	4.88
> 5,000,000	5.19	7.15
Average	4.68	5.27

Source: Interview Survey by JICA Team 1996

Monthly Energy Consumption per Household and per Capita

Income Group	LPG		Kerosene		City Gas		Electricity	Energy Consumption		Electricity Consumption
	kcal	kg	kcal	ltr	kcal	M3	kWh	kcal/C	kcal/F	per Capita (kWh/C)
Very Low Income	162,690	14.50	257,380	29.12	165,938	18.86	150	53,796	245,287	31
Low Income	239,058	21.31	265,248	30.01	125,670	14.28	160	62,210	269,874	35
Middle Income	244,097	21.76	169,065	19.13	171,100	19.44	233	59,204	255,004	52
High Income	241,474	21.52	276,250	31.25		0.00	450	57,176	266,356	107
Very High Income	346,067	30.84			317,795	36.11	1,527	52,536	334,549	294

Source: Interview Survey by JICA Team 1996

Note 1: Very Low Income :<200,000Rp per month

Low Income: >200,000Rp and <400,000Rp per month

Middle Income: >400,000Rp and <1,000,000Rp per month

High Income: >1,000,000Rp and <5,000,000Rp per month

Very High Income: >5,000,000Rp per month

Note 2: kcal/C: Energy Consumption per Capita per Month

Note 3: kcal/F: Energy Consumption per Households per Month

Interview

Average Electricity Consumption per Month by Income by Family Size

Family Size	Unit	<=2	3	4	5	6	7	8	>=9
Very Low Income	kWh	111	121	86	163	233	250	121	242
	Rp	13,333	14,500	10,333	19,500	28,000	30,000	14,500	29,000
Low Income	kWh	149	135	182	173	113	130	208	171
	Rp	17,857	16,231	21,886	20,814	13,600	15,571	25,000	20,500
Middle Income	kWh	293	184	173	289	229	229	140	708
	Rp	35,167	22,064	20,818	34,625	27,500	27,500	16,750	85,000
High Income	kWh	417	312	435	458	689			
	Rp	50,000	37,468	52,253	55,000	82,640			
Very High Income	kWh	1,042	1,708	1,038	1,635	772	2,500	833	2,083
	Rp	125,000	205,000	124,500	196,142	92,667	300,000	100,000	250,000
Total	kWh	255	278	287	510	375	830	247	603
	Rp	30,611	33,329	34,441	61,239	45,009	99,571	29,688	72,333
kWh/Capita/mon	kWh	127.5	92.67	71.75	102.00	62.50	118.57	30.88	67.00

Source: Interview Survey by JICA Team 1996

Note: Very Low Income : <200,000Rp per month

Low Income: >200,000Rp and <400,000Rp per month

Middle Income: >400,000Rp and <1,000,000Rp per month

High Income: >1,000,000Rp and <5,000,000Rp per month

Very High Income: >5,000,000Rp per month

Average Energy Consumption per Month by Income by Family Size

Family Size	Energy	<=2	3	4	5	6	7	8	>=9
Very Low Income	LPG (kg)	10	12		12				
	Kerosene(ltr)	10	23	29	5	35	24	23	68
	City Gas(M3)	10	20		15	30			
Low Income	LPG (kg)	21	23	25	17	12	24	36	18
	Kerosene(ltr)	18	23	31	29	26	46	53	17
	City Gas(M3)		10	15	20	11			
Middle Income	LPG (kg)	24	23	17	23	23	16	36	48
	Kerosene(ltr)	20	12	15	39	17	18	20	20
	City Gas(M3)			17	25				
High Income	LPG (kg)	13	21	26	20	21			
	Kerosene(ltr)			20		43			
	City Gas(M3)								
Very High Income	LPG (kg)	12	15	35	35	28			
	Kerosene(ltr)								
	City Gas(M3)		33				36	50	53
Total	LPG (kg)	19	21	23	23	23	21	36	33
	Kerosene(ltr)	17	18	24	30	28	36	34	38
	City Gas(M3)	10	21	16	25	21	36	50	53
E.C/Household	000kcal	451	580	611	743	690	871	1,144	1,173

Source: Interview Survey by JICA Team 1996

Note: Very Low Income :<200,000Rp per month

Low Income: >200,000Rp and <400,000Rp per month

Middle Income: >400,000Rp and <1,000,000Rp per month

High Income: >1,000,000Rp and <5,000,000Rp per month

Very High Income: >5,000,000Rp per month

Percentage Distribution of Sampled Households by Income Level and Cooking Hours per Day

Income (Rp)	30 Minute	1 Hour	1.5 Hours	More then 2 hours	Total
<200,000		57.14%	14.29%	28.57%	100%
200,001-400,000	6.82%	15.91%	25.00%	52.27%	100%
400,001-1,000,000		30.95%	26.19%	42.86%	100%
1,000,000-5,000,000	5.00%	25.00%	15.00%	55.00%	100%
>5,000,000		12.00%	16.00%	72.00%	100%
Total	2.90%	23.19%	21.74%	52.17%	100%

Source: Interview Survey by JICA Team 1996

Percentage Distribution of Sampled Households by Income Level and Cooking Time for Dinner

Income (Rp)	16 o'clock	17 o'clock	18 o'clock	19 o'clock	20 o'clock	Total
<200,000		28.57%	28.57%	14.29%	28.57%	100%
200,001-400,000	9.09%	38.64%	6.82%	27.27%	18.18%	100%
400,001-1,000,000	4.76%	45.24%	21.43%	14.29%	14.29%	100%
1,000,000-5,000,000		25.00%	15.00%	25.00%	35.00%	100%
>5,000,000		16.00%	16.00%	32.00%	36.00%	100%
Total	4.35%	34.06%	15.22%	23.19%	23.19%	100%

Source: Interview Survey by JICA Team 1996

Gross Regional Domestic production at Constant 1983 Market Price

DKI Jakarta

Unit: Million Rupiah

Industrial Origin	1983	%	1984	%	1985	%	1986	%	1987	%	1988	%	1989	%	1990	%	1991	%	1992	%	1993	%	Growth Rate %
Agriculture	121,336	1.55	118,027	1.36	125,091	1.39	125,871	1.33	139,897	1.30	143,277	1.24	143,252	1.14	128,220	0.94	117,466	0.80	100,931	0.63	97,086	0.56	-2.20
Manufacturing Industry	1,336,093	17.09	1,404,240	16.24	1,680,403	18.64	1,814,518	19.21	2,708,744	25.18	2,964,753	25.76	3,312,732	26.32	3,583,103	26.22	3,813,625	25.89	4,149,925	25.93	4,500,336	25.94	12.91
Electricity, Gas, Water Supply	689,806	8.82	716,847	8.29	744,922	8.27	773,776	8.19	370,196	3.44	465,095	4.04	507,563	4.03	602,695	4.41	646,598	4.39	700,328	4.38	772,994	4.46	1.15
Construction	269,931	3.45	262,470	3.03	349,158	3.87	365,542	3.87	803,556	7.47	882,469	7.67	969,234	7.70	1,152,022	8.43	1,323,443	8.98	1,562,606	9.77	1,821,946	10.50	21.04
Trade, Restorant and Hotel	922,259	11.80	973,883	11.26	916,756	10.17	974,322	10.32	2,232,326	20.75	2,432,168	21.13	2,628,860	20.89	2,854,809	20.89	3,083,923	20.94	3,277,981	20.49	3,502,802	20.19	14.28
Transportation & Communication	1,978,799	25.31	1,994,393	23.06	2,100,336	23.30	2,137,659	22.63	1,123,447	10.44	1,196,567	10.40	1,403,270	11.15	1,481,131	10.84	1,688,220	11.46	1,852,809	11.58	2,012,788	11.60	0.17
Banking and other Financial Intermediaries	1,117,439	14.29	1,756,895	20.31	1,598,071	17.73	1,693,865	17.93	1,716,776	15.96	1,630,080	14.16	1,743,032	13.85	1,881,502	13.77	1,996,214	13.55	2,231,999	13.95	2,443,254	14.08	8.14
Ownership dwellings	296,884	3.80	308,525	3.57	320,594	3.56	333,025	3.53	352,491	3.28	367,276	3.19	385,827	3.07	402,461	2.95	412,983	2.80	421,295	2.63	429,742	2.48	3.77
Public Administration and Defence	467,894	5.98	479,795	5.55	501,226	5.56	520,784	5.51	535,828	4.98	543,075	4.72	553,687	4.40	562,324	4.12	579,164	3.93	580,179	3.63	585,166	3.37	2.26
Services	618,064	7.91	633,229	7.32	676,166	7.50	705,263	7.47	774,506	7.20	884,441	7.68	938,631	7.46	1,016,452	7.44	1,068,713	7.26	1,123,504	7.02	1,184,201	6.83	6.72
Total	7,818,505	100	8,648,305	100	9,012,722	100	9,444,624	100	10,757,767	100	11,509,201	100	12,586,088	100	13,664,719	100	14,730,349	100	16,001,557	100	17,350,315	100	8.30

Source:BPS Jakarta Statistical Office [Jakarta in Figures] 1991,1992,1993,1994

Gross Regional Domestic production at Current Market Price

DKI Jakarta

Unit: Million Rupiah

Industrial Origin	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Agricultre	121,336	120,868	126,765	177,700	199,007	228,101	251,309	240,936	232,517	211,231	230,929
Manufacturing Industry	1,336,093	1,516,473	1,925,822	2,228,587	3,806,184	4,413,438	5,275,801	6,026,091	6,761,558	8,111,634	9,289,569
Electricity, Gas, Water Supply	689,806	770,600	838,036	918,765	465,228	581,192	781,225	926,405	1,097,674	1,313,106	1,600,710
Construction	269,931	339,997	407,267	460,401	1,064,636	1,292,839	1,425,751	1,703,149	2,048,293	2,542,985	3,164,537
Trade, Restorant and Hotel	922,259	1,050,291	1,081,819	1,259,282	3,014,985	3,546,799	3,961,459	4,570,591	5,276,897	5,935,640	6,774,820
Transportation & Communication	1,978,799	2,246,247	2,468,559	2,709,201	1,583,466	1,767,170	2,085,826	2,368,854	2,959,786	3,699,972	4,113,254
Banking and other Financial Intermediaries	1,117,439	1,978,264	1,843,847	1,964,884	2,437,804	2,461,420	3,032,888	3,532,133	3,931,768	4,733,219	5,449,991
Ownership dwellings	296,884	317,781	340,695	381,814	387,941	436,033	570,301	644,019	686,782	754,175	875,599
Public Administration and Defence	467,894	525,122	637,169	728,604	737,829	770,236	799,823	885,740	1,105,663	1,291,044	1,510,292
Services	618,064	744,881	849,447	915,746	1,089,954	1,298,805	1,599,553	1,932,326	2,254,212	2,550,183	2,920,303
Total	7,818,505	9,610,573	10,519,424	11,744,982	14,787,034	16,796,033	19,783,936	22,830,244	26,355,150	30,943,189	35,930,004

Source:BPS Jakarta Statistical Office [Jakarta in Figures] 1991,1992,1993,1994

Regional Income and per Capita Income, at Constant 1983 Market Price

DKI Jakarta

Description	Unit	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Gross Regional Domestic Product	Million Rp	7,818,505	8,648,305	9,012,722	9,444,604	10,757,763	11,469,201	12,586,088	13,664,719	14,730,349	16,001,557	17,350,315
Depretion of capital Goods	Million Rp	595,770	659,001	686,769	719,679	761,586	824,258	926,744	1,012,750	1,224,092	1,329,729	1,441,811
Net Regional Domestic Product	Million Rp	7,222,735	7,989,304	8,325,953	8,724,926	9,996,177	10,644,300	11,659,344	12,651,969	13,506,257	14,671,828	15,908,504
Net Indirect taxes	Million Rp	33,620	37,188	38,755	40,612	42,977	46,544	340,749	372,373	536,185	582,457	631,551
Net Regional Domestic Product at factor Lost	Million Rp	7,189,115	7,952,116	8,287,198	8,684,314	9,953,200	10,597,855	11,318,595	12,279,596	12,970,072	14,089,371	15,276,952
Mid Year Population	Thousand	7,191	7,472	7,765	8,066	7,630	7,813	7,999	8,190	8,370	8,538	8,710
Per Capita Regional Income	Rp	999,807	1,064,198	1,067,291	1,076,683	1,304,556	1,356,508	1,414,927	1,499,325	1,549,602	1,650,196	1,754,037
Per Capita Net Regional Domestic Product	Rp	1,087,338	1,157,366	1,160,730	1,170,944	1,410,009	1,468,039	1,573,375	1,668,447	1,759,911	1,874,158	1,992,092

Source:BPS Jakarta Statistical Office [Jakarta in Figures] 1991,1992,1993,1994

Regional Income and per Capita Income, at Current Market Price

DKI Jakarta

Description	Unit	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Gross Regional Domestic Product	Million Rp	7,818,505	9,610,523	10,819,424	11,744,982	14,787,032	16,796,033	19,783,936	22,830,244	26,355,150	30,943,189	35,930,004
Depretion of capital Goods	Million Rp	595,770	732,322	801,580	894,968	1,046,214	1,219,303	1,475,386	1,704,255	2,190,113	2,571,379	2,985,783
Net Regional Domestic Product	Million Rp	7,222,735	8,878,201	9,717,844	10,850,014	13,740,818	15,576,730	18,308,550	21,125,989	24,165,037	28,371,810	32,944,221
Net Indirect taxes	Million Rp	33,620	41,325	45,234	50,503	59,038	68,806	542,477	626,628	959,327	1,126,332	1,307,852
Net Regional Domestic Product at factor Lo	Million Rp	7,189,115	8,836,876	9,672,611	10,799,511	13,681,780	15,507,924	17,766,073	20,499,361	23,205,710	27,245,478	31,636,369
Mid Year Population	Thousand	7,191	7,472	7,765	8,066	7,630	7,813	7,999	8,190	9,370	8,538	8,710
Per Capita Regional Income	Rp	999,807	1,182,602	1,245,716	1,338,926	1,793,257	1,984,989	2,220,961	2,503,974	2,772,506	3,191,084	3,632,358
Per Capita Net Regional Domestic Product	Rp	1,087,338	1,286,136	1,354,775	1,456,146	1,938,122	2,149,865	2,473,172	2,787,548	3,148,786	3,624,173	4,125,336

Source:BPS Jakarta Statistical Office [Jakarta in Figures] 1991,1992,1993,1994

Number of Household

	South Jaka	East Jakar	Central Ja	West Jaka	North Jaka	Total
RELITA I	-	-	896	-	20	916
RELITA II	153	90	3715	121	181	4260
RELITA III	454	339	2693	307	706	4499
RELITA IV	593	594	1110	502	1612	4411
RELITA V						
1989/1990	88	64	95	90	226	563
1990/1991	120	122	213	173	251	879
1991/1992	114	102	125	114	163	618
1992/1993	109	122	162	134	126	653
1993/1994	217	226	339	211	225	1218

** First Five Years Development Plan=RELITA I

Projected Population Growth in Jabotabek and Karawang
1995-2015

(000)

Region	1995	2000	2005	2010	2015	Growth Rate(p.a.)
D.K.I Jakarta	8,964	9,730	10,487	11,178	11,748	1.4
Bogor	4,805	5,774	6,533	7,407	8,066	2.6
Tangergang	3,570	4,606	5,504	6,523	7,458	3.8
Bekasi	2,697	3,148	4,066	4,802	5,464	3.6
Botabek	11,072	13,528	16,103	18,732	20,988	3.2
Jabotabek	20,036	23,258	26,590	29,910	32,736	2.5
karawang	1,498	1,630	1,817	2,066	2,372	2.3
Total	21,534	24,888	28,407	31,976	35,108	2.5

Source:Jabotabek Metropolitan Development Plan Review(JMDPR)

Percentage of Households by Monthly Expenditure Class and Type of Cooking Fuel
1995

Urban

Monthly Expenditure Class Rp	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
<30.000	-	-	29.11	69.03	-	1.86
30,000 - 39,999	2.51	-	45.33	52.16	-	-
40,000 - 49,999	5.96	0.84	32.81	55.72	-	4.67
50,000 - 74,999	4.42	0.75	42.46	50.45	0.98	0.95
75,000 - 99,999	5.99	0.54	47.15	42.36	0.65	3.31
100,000 - 149,999	5.89	0.96	58.23	32.23	0.40	2.29
150,000 - 199,999	5.18	1.37	68.28	23.25	0.21	1.71
200,000 - 299,999	6.35	3.76	74.50	13.98	0.26	1.15
300,000 - 399,999	6.32	9.46	75.52	7.70	0.38	0.61
400,000 - 499,999	4.68	19.59	69.87	4.63	0.68	0.54
>500,000	5.15	41.63	49.75	2.07	1.14	0.26
Indonesia	5.73	10.47	65.91	16.21	0.47	1.21

Rural

Monthly Expenditure Class Rp	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
<30.000	2.39	-	-	94.72	1.13	1.75
30,000 - 39,999	0.98	-	3.01	93.90	-	2.10
40,000 - 49,999	1.69	0.25	3.33	94.21	-	0.52
50,000 - 74,999	2.05	0.08	5.05	92.06	0.13	0.64
75,000 - 99,999	2.47	0.07	5.86	91.13	0.16	0.30
100,000 - 149,999	2.35	0.25	9.85	87.08	0.24	0.23
150,000 - 199,999	2.74	0.37	14.00	82.26	0.39	0.24
200,000 - 299,999	3.80	0.56	22.98	71.60	0.66	0.40
300,000 - 399,999	3.96	2.97	33.62	58.60	0.50	0.36
400,000 - 499,999	5.32	7.11	38.79	47.61	1.09	0.09
>500,000	4.92	12.87	42.38	39.66	0.18	-
Indonesia	2.85	0.71	14.37	81.37	0.36	0.33

Source: Housing and Settlement Statistics 1995

Household Consumption on Energy in Indonesia
1993

Type of Energy	Unit	Jawa			Non-Jawa			Indonesia		
		urban	Rural	Total	Urban	Rural	Total	urban	Rural	total
Electricity	000MWh	10,365	3,012	13,377	39,767	12,500	52,267	50,132	15,512	65,644
N.Gas	Juta M3	14	1	15	47	6	53	61	7	68
LPG	000Ton	208	7	215	508	28	536	716	35	751
kerosene	Juta Ltr	3,068	1,671	4,739	12,425	9,478	21,903	15,493	11,149	26,642
Charcoal	000 Ton	41	49	90	150	202	352	191	251	442
Gasoline	Juta Ltr	10	3	13	107	69	176	117	72	189
Lubricants	Juta Ltr	1	1	2	2	9	11	3	10	13

Source: Statistical Year Book of Indonesia

Quantity of Electricity (MWh) Sold by Tariff

DKI Jakarta

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Social					170,643	189,565	209,897	224,671	234,747	248,736	264,749
Household					1,895,621	2,108,512	2,213,546	2,432,357	2,742,548	3,066,837	3,091,226
Shop					733,279	912,011	1,030,922	1,212,116	1,489,352	1,682,975	1,995,962
Hotel					147,510	160,469	180,802	202,720	221,161	244,418	258,039
Large Manufacture					1,581,785	1,929,229	2,317,150	2,914,469	3,438,543	3,706,776	4,208,602
Government Building					523,567	569,231	596,673	642,287	640,961	609,367	524,718
Road					45,906	48,796	44,781	49,466	55,875	63,554	72,461
Total					5,098,011	5,917,813	6,593,771	7,678,086	8,823,187	9,622,663	10,415,757

Source: BPS Jakarta Statistical Office [Jakarta in Figures] 1994

Quantity of Fuel & Lubricants of Large and Medium Manufacturing

DKI Jakarta

Fuel Type	Unit	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Gasoline	Ltr	27,028,469	15,471,486	45,854,977	14,700,964	15,761,934	16,574,311	21,069,626	23,434,062	22,519,044	26,431,635
Solar	Ltr	222,781,286	222,395,550	167,097,778	179,751,319	196,009,242	189,442,936	440,712,927	290,836,818	212,193,832	249,746,418
Diesel Oil	Ltr	161,269,252	113,943,575	147,865,403	150,173,244	149,156,356	153,112,552	152,675,099	146,699,195	61,033,620	84,028,738
Kerosene	Ltr	28,710,144	27,074,461	26,561,876	17992434	20,768,706	30,853,713	24,006,701	39,284,723	63,027,228	43,134,077
Coal	Kg	1,370,143	38,455	206,969	102,470	169,320	72,630	55,715	3,500	15,200	11,568,095
Cokes	Kg	528,367	617,927	1,893,913	1,940,059	2,228,258	3,171,731	2,491,599	1,652,573	1,720,465	596,325
Gas	M3	7,948,950	9,298,430	33,068,577	32,040,625	47,743,760	52,822,555	63,080,465	87,947,707	99,498,720	102,677,394
Other fuel		-	-	-	-	-	-	-	-	-	-
Lubricants	Ltr	4,548,007	5,158,466	5,532,842	5,218,404	5,411,989	5,804,149	6,008,850	30,913,807	5,257,429	5,049,226

Source:BPS Jakarta Statistical Office [Jakarta in Figures] 1990,1991,1992,1993,1994

Percentage of Households by Type of Cooking Fuel
1995

Urban

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	5.85	19.34	72.00	0.30	0.60	1.92
Jawa Barat	6.28	12.30	73.19	6.84	0.36	1.02
Indonesia	5.73	10.47	65.91	16.21	0.47	1.21

Rural

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	4.18	0.54	33.03	61.86	0.10	0.28
Jawa Barat	3.71	0.56	7.47	87.67	0.15	0.43
Indonesia	2.85	0.71	14.37	81.37	0.36	0.33

Total

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	5.85	19.34	72.00	0.30	0.60	1.92
Jawa Barat	5.03	5.27	49.18	39.74	0.21	0.58
Indonesia	3.85	4.10	32.24	58.78	0.40	0.63

Percentage of Households by Source of Lighting
1995

Urban

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	98.44	0.56	0.52	0.46	0.02
Jawa Barat	94.87	0.45	1.30	3.04	0.33
Indonesia	92.14	1.25	2.30	4.07	0.24

Rural

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	-	-	-	-	-
Jawa Barat	60.57	3.09	5.56	29.51	1.26
Indonesia	47.45	5.09	10.20	35.65	1.61

Total

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	98.44	0.56	0.52	0.46	0.02
Jawa Barat	74.37	2.03	3.85	18.86	0.89
Indonesia	62.94	3.76	7.46	24.70	1.14

Source: Housing and Settlement Statistics 1995

Note: PLN State Electricity Company

Percentage of Households by Type of Cooking Fuel
1992

Urban

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	4.86	17.30	76.25	0.52	0.13	0.94
Jawa Barat	3.91	6.81	73.62	14.52	0.10	1.04
Indonesia	4.75	8.15	63.56	21.91	0.44	1.19

Rural

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	-	-	-	-	-	-
Jawa Barat	1.74	0.82	25.14	71.62	0.10	0.59
Indonesia	1.33	1.26	11.23	85.65	0.13	0.41

Total

	Electricity	Gas/LPG	Kerosene	Firewood	Charcoal	Others
DKI Jakarta	4.86	17.30	76.25	0.52	0.13	0.94
Jawa Barat	2.47	2.85	41.58	52.25	0.10	0.74
Indonesia	2.38	3.38	27.32	66.05	0.22	0.65

Percentage of Households by Source of Lighting
1992

Urban

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	98.50	0.29	0.59	0.55	0.07
Jawa Barat	90.62	0.36	1.69	6.68	0.65
Indonesia	87.86	1.43	3.86	6.55	0.31

Rural

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	-	-	-	-	-
Jawa Barat	41.01	1.74	10.05	46.07	1.13
Indonesia	30.75	4.49	15.42	46.84	2.50

Total

	PLN	Non PLN	Pumped Lamp	Oil Lamp	Others
DKI Jakarta	98.50	0.29	0.59	0.55	0.07
Jawa Barat	57.84	1.27	7.21	32.71	0.97
Indonesia	48.31	3.55	11.87	34.45	1.83

Source: Housing and Settlement Statistics 1992

Note: PLN State Electricity Company

Estimate of Liquid Propane Gas and Gases Used by Province

1990

Province	Average of Household Members	Estimate of Household Using Gase and LPG	Average of Gases and LPG Used per P/M Kg		Total of Gases and LP Used per Year	Energy Content for One Year Total Gases and LPG Used
			Gases	LPG	Ton	Terajoule
Indonesia	4.63	564,858	0.01	0.09	1567.71	72.11
DKI Jakarta	4.93	196,109	0.09	1.02	6433.58	295.94
Jawa Barat	4.36	106,046	0.01	0.07	221.92	10.21
Jawa Tengah	4.47	61,717	0.00	0.02	33.08	1.52
DI Yogyakarta	4.1	11,184	0.00	0.08	21.99	1.01
Jawa Timur	4.2	58,199	0.00	0.07	107.76	4.73

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1990 National Socio Economic Survy Result)

Energy content of liquid propane gas per kton = 46.0 terajoule

*kol(7)=kol(6)*46.0:1000*

*kol(6)=kol(2)*kol(3)*(kol(4)+kol(5))*12: 1000*

Estimate of Liquid Propane Gas and Gases Used by Province

1993

Province	Average of Household Members	Estimate of Household Using Gase and LPG	Average of Gases and LPG Used per P/M Kg		Total of Gases and LP Used per Year	Energy Content for One Year Total Gases and LPG Used
			Gases	LPG	Ton	Terajoule
Indonesia	4.49	1,420,167	0.01	0.10	420,505	193.43
DKI Jakarta	4.61	323,219	6.33	0.73	63,084	2,901.85
Jawa Barat	4.24	246,111	4.05	0.1	26,004	1,196.16
Jawa Tengah	4.28	159,093	2.66	0.04	11,024	507.10
DI Yogyakarta	4	13,109	1.86	0.12	622	28.63
Jawa Timur	4.03	223,949	3.52	0.07	19,456	894.97

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1993 National Socio Economic Survy Result)

Energy content of liquid propane gas per kton = 46.0 terajoule

*kol(7)=kol(6)*46.0:1000*

*kol(6)=kol(2)*kol(3)*(kol(4)+kol(5))*12: 1000*

Estimate of Kerosene Used by Province

1990

Province	Average o Household Members	Estimate of Household Using Kerosene	Average of Kerosene Used per Capita per Month Liter	Total of Kerosene Used per Year 1000 liter	Energy Content for One Year Total kerosene used Terajoule
Indonesia	4.63	125,524	3.10	21,619.76	729.30
DKI Jakarta	4.93		6.33		
Jawa Barat	4.36	20,888	4.05	4,426.06	149.30
Jawa Tengah	4.47	41,993	2.66	5,991.68	202.12
DI Yogyakarta	4.1	13,726	1.86	1,256.09	42.37
Jawa Timur	4.2	15,729	3.52	270.53	94.13

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1990 National Socio Economic Survy Result)

Energy content of kerosene per kton = 42.7 terajoule

*kol(6)=kol(5)*0.79*42.7:1000*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

1 liter=0.79kg

Estimate of Kerosene Used by Province

1993

Province	Average o Household Members	Estimate of Household Using Kerosene	Average of Kerosene Used per Capita per Month Liter	Total of Kerosene Used per Year 1000 liter	Energy Content for One Year Total kerosene used Terajoule
Indonesia	4.49	11,478,979	3.05	1,886,386.55	63,633.48
DKI Jakarta	4.61	1,424,593	6.33	498,857.79	16,827.97
Jawa Barat	4.24	3,590,635	4.05	739,900.63	24,959.07
Jawa Tengah	4.28	1,143,731	2.66	156,253.73	5,270.91
DI Yogyakarta	4	156,337	1.86	13,957.78	470.84
Jawa Timur	4.03	1,924,004	3.52	327,517.73	11,048.16

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1993 National Socio Economic Survy Result)

Energy content of kerosene per kton = 42.7 terajoule

*kol(6)=kol(5)*0.79*42.7:1000*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

1 liter=0.79kg

Estimate of Charcoal Used by Province

1990

Province	Average of Household Members	Estimate of Household Using Charcoal	Average of Charcoal Used per Capita per Month kg	Total of Charcoal Used per Year Ton	Energy Content for One Year Total Charcoal used Terajoule
Indonesia	4.63	125,524	0.07	488.19	8,201.56
DKI Jakarta	4.93	0	0.00	0.00	0.00
Jawa Barat	4.36	20,888	0.10	109.29	1,836.00
Jawa Tengah	4.47	41,993	0.07	157.68	2,648.95
DI Yogyakarta	4.10	13,726	0.09	60.78	1,021.08
Jawa Timur	4.20	15,729	0.08	63.42	1,065.48

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1990 National Socio Economic Survy Result)

Energy content of Charcoal per ton = 8.4 terajoule(1 ton =2km3)

*kol(6)=kol(3)*8.4*2*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

Estimate of Charcoal Used by Province

1993

Province	Average of Household Members	Estimate of Household Using Charcoal	Average of Charcoal Used per Capita per Month kg	Total of Charcoal Used per Year Ton	Energy Content for One Year Total Charcoal used Terajoule
Indonesia					
DKI Jakarta	4.61	2,429	0.01	1.34	22.57
Jawa Barat	4.24	8,635	0.08	35.15	590.52
Jawa Tengah	4.28	26,738	0.06	82.40	1,384.27
DI Yogyakarta	4.00	8,267	0.06	23.81	400.01
Jawa Timur	4.03	12,260	0.06	35.57	597.64

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1993 National Socio Economic Survy Result)

Energy content of Charcoal per ton = 8.4 terajoule(1 ton =2km3)

*kol(6)=kol(3)*8.4*2*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

Estimate of Electricity Used by Province

1990

Province	Average of Household Members	Estimate of Household Using Electricity	Average of Electricity Used per Capita per Month kWh	Total of Electricity Used per Year 1000kWh	Energy Content for One Year Total Electricity used Terajoule
Indonesia	4.63	294,197	4.76	77,804.94	280.10
DKI Jakarta	4.93	36,278	21.88	46,959.59	169.05
Jawa Barat	4.36	70,697	5.27	19,493.16	70.18
Jawa Tengah	4.47	32,449	3.58	6,231.27	22.43
DI Yogyakarta	4.10	3,341	5.31	872.76	3.14
Jawa Timur	4.20	36,178	4.14	7,548.71	27.18

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1990 National Socio Economic Survy Result)

Energy content of Charcoal per ton = 8.4 terajoule(1 ton =2km3)

*kol(6)=kol(5)*3.6 :1000*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

1mkWh =3.6 terajoule

Estimate of Electricity Used by Province

1993

Province	Average of Household Members	Estimate of Household Using Electricity	Average of Electricity Used per Capita per Month kWh	Total of Electricity Used per Year 1000kWh	Energy Content for One Year Total Electricity used Terajoule
Indonesia	4.49	1,000,909	6.91	372,649.23	1,341.54
DKI Jakarta	4.61	90,800	25.32	127,183.78	457.86
Jawa Barat	4.24	213,297	7.53	81,719.71	294.19
Jawa Tengah	4.28	148,398	6.04	46,035.20	165.73
DI Yogyakarta	4.00	21,898	9.43	9,911.91	35.68
Jawa Timur	4.03	177,361	6.58	56,437.83	203.18

Source: BPS Environmental Statistics of Indonesia 1995

Note: (Calculation from 1993 National Socio Economic Survy Result)

Energy content of Charcoal per ton = 8.4 terajoule(1 ton =2km3)

*kol(6)=kol(5)*3.6 :1000*

*kol(5)=kol(2)*kol(3)*kol(4)*12: 1000*

1mkWh =3.6 terajoule

Percentage of Households Type of Lighting

Province	Electricity			Pumped Lamp			Kerosene Lamp			Others		
	1990	1992	1994	1990	1992	1994	1990	1992	1994	1990	1992	1994
DKI Jakarta	95.6	988.8	98.9	1.7	0.5	0.6	2.7	0.6	0.5	0.1	0.1	0.0
Jawa Barat	53.8	59.1	70.6	4.6	7.2	4.9	41.3	32.7	23.3	0.3	1.0	1.1
Jawa Tengah	45.0	50.6	63.7	8.3	10.7	8.5	46.7	38.5	27.6	0.1	0.2	0.3
D.I Yogyakarta	57.1	57.9	76.0	1.8	3.7	1.1	41.1	38.3	22.9	0.0	0.1	0.0
Jawa Timur	45.8	52.3	64.2	12.1	14.1	9.3	41.8	31.3	26.3	0.4	2.3	0.2
Indonesia	46.8	51.9	60.9	7.9	11.8	9.5	44.7	34.5	28.1	0.6	1.8	1.4

Source 1990 Population Census Series S No.2,1992 and 1994 National Socio Economic survey

Percentage of Households by Floor Area

Province	<=19m^2		20-49m^2		50-99m^2		100-149m^2		>=150m^2	
	1992	1994	1992	1994	1992	1994	1992	1994	1992	1994
DKI Jakarta	11.31	9.40	30.40	32.32	36.85	32.21	12.64	13.17	8.80	12.91
Jawa Barat	23.64	17.87	28.82	28.64	10.33	14.64	20.71	18.62	16.50	20.23
Jawa Tengah	13.11	9.86	24.58	24.46	14.52	16.52	30.56	30.42	17.23	18.73
D.I Yogyakarta	7.18	8.08	29.59	31.72	19.55	24.57	31.36	27.50	12.32	8.13
Jawa Timur	13.07	9.40	20.31	19.40	14.82	14.08	33.70	40.49	18.09	16.63
Urban	25.98	20.36	38.76	38.84	13.35	15.49	14.15	14.22	7.76	11.08
Rural	15.08	10.80	21.06	19.68	13.39	15.60	30.73	32.43	19.73	21.49
Urban+Rural	17.82	13.39	25.51	24.88	13.38	15.57	26.56	27.49	16.73	18.66

Source 1992 and 1994, National Socio Economic survey

Urban Gas Development Area for Short and Long Time(Residential Sector)

PGN Jakarta Branch Area

No.	Location	City Name	Area Size (Ha)	Unit	Mark G/P	Distance Km	Exiting	City Gas Demand 10^3 Nm3
1	Bartar Gebang	Bekasi	339.86	2,001	G	1km	1987	
2	Klender	Bekasi	290.44	11,419	G	1km	1977	
3	Margahayu	Bekasi	2.57	3,500	G	5km	1988	
4	Narogong	Bekasi	4.5	260	G	5km	1994	
5	Setia Mekar	Bekasi	123.04	6,416	G	5km	1985	
6	Rawa Tembage	Bekasi	710.31	7,784	G	5km	1978	
7	Rawa Lumbu	Bekasi	205.99	8,247	G	5km	1988	
	Total of Households (End of 2000)			39,627				15,260
1	Bekasi Utara	Bekasi	200	9,000	P	1km		
2	Harapan Jaya	Bekasi	700	4,500	P	1km	1994	
3	Harapan Baru	Bekasi	75	3,000	P	1km	2000	
4	Taman Harapan Baru	Bekasi	100	3,000	P	1km		
5	Vila Nusa Indah	Bekasi	200	3,000	P	1km		
6	Desa Tri Daya Sakti Tambun	Bekasi	30	2,924	P	1km	1995	
7	Perjuangan Raya Haraoan Baru	Bekasi	72	2,000	P	1km	1995	
8	Desa Kaliabang Tengah Bekasi Utara	Bekasi	27.46	1,824	P	1km	1996	
9	Vila Indah Permai	Bekasi	100	1,500	P	1km		
10	Desa Harapan Jaya	Bekasi	12	534	P	1km	1994	
11	Teman Kebalen	Bekasi	100	500	P	1km		
12	Bintara Bekasi Barat	Bekasi	13.5	400	P	1km	1995	
12	Vila Jatibening Tol	Bekasi	5	140	P	1km		
13	Vila Jaka Setia	Bekasi	8		P	1km		
14	Vila Beksi Indahii	Bekasi	20		P	1km		
15	Harapan Jaya	Bekasi			P	1km		
16	Desa Jatirasa Jatiasih	Bekasi	11.5		P	10m		
17	Bojong Menteng Bekasi Timur	Bekasi	300	6,000	P	10km	2000	
18	Desa Karangsatria Kec. Tambun	Bekasi	90	3,940	P	10km	2000	
19	Desa Tri Daya Sakti Wanasari	Bekasi	35	2,500	P	10km	1995	
20	Hasanuddin Tambun	Bekasi	15	1,400	P	10km	1995	
21	Pramuka	Bekasi	31	1,250	P	10km		
22	Desa Cikarageman Setu	Bekasi	15	1,200	P	10km	1995	
23	Desa Jatibenning	Bekasi	30	1,200	P	10km	1996	
24	Putra Alvita Oratama, PT	Bekasi	2000	1,000	P	10km	1994	
25	Pamahan Jatiasih	Bekasi	75	966	P	10km	1996	
26	Desa Tridaya sakti Tambun	Bekasi	15	903	P	10km	1998	
27	Taman Kota	Bekasi	15	520	P	10km	1997	
28	Vila Mahkota Pesona	Bekasi	80	500	P	10km		
29	Pekayon Jaya	Bekasi	12.5	447	P	10km		
30	Mangunjaya Tambun	Bekasi		446	P	10km	1995	
31	Desa Tambun Cibitung	Bekasi	35	395	P	10km	1995	
32	Desa Jatibening Pondok Gede	Bekasi		321	P	10km		
33	Jatiwarna Jatimurni Pondok Gede	Bekasi	14.5	300	P	10km	1995	
34	Narogong Raya Desa Sepanjang Jaya	Bekasi	4.8	183	P	10km	1996	
35	Pondok Gede	Bekasi	80	130	P	10km	1996	
36	Jatirasa Pondok Gede	Bekasi	16.5	100	P	10km	1996	
37	Jatibening	Bekasi	10	50	P	10km		
38	Kaliabang	Bekasi	32		P	10km		
39	Imam Bonjol	Bekasi	120		P	10km		
40	Klari, Karawang	Bekasi						

No.	Location	City Name	Area Size (Ha)	Unit	Mark G/P	Distance Km	Exiting
1	Kebon Kacang	DKI Jakart	1.82	536	G		1983
2	Tanah Abang	DKI Jakart	4.32	960	G		1983
3	Kemayoran	DKI Jakart	30	5,346	G		1990
4	Pulo Gadung	DKI Jakart	3.46	154	G		1991
	Total of Households (End of 2000)			6,996			
1	Desa Daru Kec. Tigarasa	Tangerang	10	151	G	10km	
2	Ciracas Serang	Tangerang		393	G	10km	
3	Desa Ciwedus Kec. Cilegon	Tangerang	32.67	700	G	10km	
4	Cisati Kragilan	Tangerang	12	800	G	10km	
5	Kec. Cisoka	Tangerang	11	1,500	G	10km	
6	Desa Sukatani Kec.Rajeg	Tangerang	18.5	1,576	G	10km	
7	Tangerang	Tangerang		17	G	1km	
8	Kelapa Dua	Tangerang	44.68	2,399	G	1km	1985
8	Ds.Cibogo, Serpong	Tangerang	3.5	181	G	5km	
9	Desa Suradita, Serpong	Tangerang	50.5	1,017	G	5km	
10	Desa Jelupang BSD	Tangerang		1,038	G	5km	
11	Desa Makar Bhakti Kec. Cikupa	Tangerang	11.3	1,062	G	5km	
12	Cengkareng	Tangerang	334	2,944	G	5km	1978
13	Karawaci	Tangerang	508.93	20,486	G	5km	1978
14	Tanggerang	Tangerang			G		
	Total of Households (End of 2000)			34,264			
15	Raya Binong Curug	Tangerang	30	5,660	P	5km	1996
16	Tol Jakarta Merak Desa Kadu, Curug	Tangerang	218	4,190	P	5km	1996
17	Desa Binong,Curug	Tangerang	300	2,000	P	5km	2000
18	Pala Raya Desa Pondok Cabe Udik Pa	Tangerang	60	1,400	P	5km	2001
19	Kota Bumi Kutajaya, Pasar Kemis	Tangerang	8.33	800	P	5km	1996
20	Desa Mauk, Priok	Tangerang	11	629	P	5km	1998
21	Balaraja Timur	Tangerang		230	P	5km	2010
22	Serpong	Tangerang	12		P	5km	2000
23	Desa Pasar Kemis	Tangerang	15		P	5km	
24	Imam Bonjol Panunggangan Barat Jati	Tangerang		2,500	P	1km	1996
25	Desa Sukaharja Pasar Kemis	Tangerang	200	1,139	P	1km	1998
26	Batu Ceper	Tangerang	10	450	p	1km	1996
27	Raya Serang Km.2 Cimone	Tangerang		140	P	1km	1996
28	Desa Keroncong	Tangerang	2.3	119	P	1km	1996
29	Desa Pesanggrahan Cileles Cisoka	Tangerang	200	15,000	P	10km	2000
30	Raya Legok Medang, Legok	Tangerang	20	8,000	P	10km	1998
31	Desa Pete, Tigaraksa	Tangerang	20	8,000	P	10km	2010
32	Raya Anyer Kubangsari Ciwandan, Se	Tangerang	50	3,700	P	10km	1996

No.	Location	City Name	Area Size (Ha)	Unit	Mark G/P	Distance Km	Exiting
33	Desa Makarsari Rajeg	Tangerang	50	2,780	P	10km	1998
34	Raya Serang Sukajaya, Serang	Tangerang	30	2,500	P	10km	2000
35	Raya Serang,Citerep kec. Ciruas,Seran	Tangerang	25	1,618	P	10km	1998
36	Raya Karang Surang Cinangka Serang	Tangerang	60	1,000	P	10km	1996
37	Ciledug Raya Sudimara Barat Ciledug	Tangerang	10	1,000	P	10km	1998
38	Karang Mulya Ciledug	Tangerang	47.5	994	P	10km	1998
39	Sawah luhur Desa Warung Jaud Kaser	Tangerang	15	772	P	10km	1997
40	Raya Ciputat Pamulang Timur Pamula	Tangerang	30	600	P	10km	1996
41	Pondok Cabe Desa Cirendeu Ciputat	Tangerang	40	600	P	10km	1996
42	Desa Pamulang Timur Pamulang	Tangerang	15	559	P	10km	1995
43	Ciledung Raya Cipadu,Kreo	Tangerang	6	464	P	10km	1995
44	Raya Jombang,Ciputat	Tangerang	54875	400	P	10km	1996
45	Cipadu Jaya', Ciledug	Tangerang		389	P	10km	1996
46	Pisangan Ciputat	Tangerang		350	P	10km	2000
47	Pondok Cabe Udik Pamulang	Tangerang	5	200	P	10km	1996
48	Cendrawasih Cipayung,Ciputat	Tangerang	5	124	P	10km	1997
49	RE. Martadinata Ciputat	Tangerang	15	95	P	10km	1996
50	Kec. Cisoka	Tangerang	150		P	10km	1996

Location of New low Price Apartmant

DKI Jakarta

No.	Location	type	units	floors	Remarks
	Central				
1	karang Anyar	18	380	4	Completed
2	Kebon Kacang	51	56	4	Completed
		42	230		
		21	240		
3	Tnh Abang	36	960	4	Completed
4	Kemayoran	18	64	4	Completed
		21	480		
		36	283		
5	Tnh Tinggi	18	420	4	Completed
6	Pejompongan	21	720	10	Under Construction
7	Karet Tengsin	21		5	Under Construction
8	Jati Bunder	21	40	4	Under Construction
9	Rawasari		152		
	North Jakarta				
10	Penjaringan	18	1070	4	completed
		36			
		54			
11	Flat Pluit	36	480	4	completed
12	Penjaringan	192			
	West Jakarta				
13	Angke	240			
14	Tambora Jaya	18	489	4	Completed
15	Tambora III	18	48	4	Completed
16	Bulak Wadon	21		4	Under Construction
17	Cengkareng	480			
	South Jakarta				
18	Tebet	21	288	4	Under Construction
19	Rawa Bilal		64		
	East Jakarta				
20	Pulomas	14	272	4	Completed
21	klender	36	1216	4	Completed
22	Pulo Gadung	36	160	4	Completed
23	Kalimati	18	720	5	Under Construction
24	Bidaracina		688		
25	Pondok Bambu		125		
26	Pondok kelapa		150		
27	Cipinang Besar		152		

Residential Park Development Plan

No.	Location	City Name	Area Size (Ha)	Unit
1	Jatirasa Pondok Gede	Bekasi	16.5	100
2	Pondok Gede	Bekasi	80	130
3	Narogong Raya Desa Sepanjang Jaya	Bekasi	4.8	183
4	Jatiwarna Jatimurni Pondok Gede	Bekasi	14.5	300
5	Desa Jatibening Pondok Gede	Bekasi		321
6	Desa Tambun Cibitung	Bekasi	35	395
7	Mangunjaya Tambun	Bekasi		445
8	Pekayon Jaya	Bekasi	12.5	447
9	Vila Mahkota Pesona	Bekasi	80	500
10	Taman Kota	Bekasi	15	520
11	Desa Tridaya sakti Tambun	Bekasi	15	903
12	Pamahan Jatiasih	Bekasi	75	966
13	Putra Alvita Oratama, PT	Bekasi	2000	1,000
14	Desa Cikarageman Setu	Bekasi	15	1,200
15	Desa Jatibening	Bekasi	30	1,200
16	Pramuka	Bekasi	31	1,250
17	Hasanuddin Tambun	Bekasi	15	1,400
18	Desa Tri Daya Sakti Wanasari	Bekasi	35	2,500
19	Desa Karangsatria Kec. Tambun	Bekasi	90	3,940
20	Bojong Meoteng Bekasi Timur	Bekasi	300	6,000
21	Imam Boojol	Bekasi	120	
22	Kaliabang	Bekasi	32	
23	Desa Jatirasa Jatiasih	Bekasi	11.5	
24	Vila Jatibening Tol	Bekasi	5	140
25	Bintara Bekasi Barat	Bekasi	13.5	400
26	Teman Kebalen	Bekasi	100	500
27	Desa Harapan Jaya	Bekasi	12	534
28	Vila Indah Permai	Bekasi	100	1,500
29	Desa Kaliabang Tengah Bekasi Utara	Bekasi	27.46	1,824
30	Perjuangan Raya Harapan Baru	Bekasi	72	2,000
31	Desa Tri Daya Sakti Tambun	Bekasi	30	2,924
32	Harapan Baru	Bekasi	75	3,000
33	Taman Harapan Baru	Bekasi	100	3,000
34	Vila Nusa Indah	Bekasi	200	3,000
35	Harapan Jaya	Bekasi	700	4,500
36	Bekasi Utara	Bekasi	200	9,000
37	Harapan Jaya	Bekasi		
38	Vila Beksi Indahii	Bekasi	20	
39	Vila Jaka Setia	Bekasi	8	
40	Klari, Karawang	Bekasi		
41	RE. Martadinata Ciputat	Tangerang	15	95
42	Cendrawasih Cipayung,Ciputat	Tangerang	5	124
43	Pondok Cabe Udik Pamulang	Tangerang	5	200
44	Pisangan Ciputat	Tangerang		350
45	Cipadu Jaya, Ciledug	Tangerang		389
46	Raya Jombang,Ciputat	Tangerang	54875	400
47	Ciledung Raya Cipadu,Kreo	Tangerang	6	464
48	Desa Pamulang Timur Pamulang	Tangerang	15	559
49	Pondok Cabe Desa Cirendeu Ciputat	Tangerang	40	600
50	Raya Ciputat Pamulang Timur Pamulang	Tangerang	30	600
51	Sawah Iuhur Desa Warung Jaud Kasemen,	Tangerang	15	772
52	Karang Mulya Ciledug	Tangerang	47.5	994
53	Raya Karang Surang Cisangka Serang	Tangerang	60	1,000
54	Ciledug Raya Sudimara Barat Ciledug	Tangerang	10	1,000
55	Raya Serang,Citerep kec. Ciruas,Serang	Tangerang	25	1,618
56	Raya Serang Sukajaya, Serang	Tangerang	30	2,500
57	Desa Makarsari Rajeg	Tangerang	50	2,780
58	Raya Anyer Kubangsari Ciwandan, Serang	Tangerang	50	3,700
59	Raya Legok Medang, Legok	Tangerang	20	8,000
60	Desa Pete, Tigaraksa	Tangerang	20	8,000
61	Desa Pesanggrahan Cileles Cisoka	Tangerang	200	15,000
62	Desa Keroncong	Tangerang	2.3	119
63	Raya Serang Km.2 Cimone	Tangerang		140
64	Desa Sukaharja Pasar Kemis	Tangerang	200	1,139
65	Imam Bonjol Penunggangan Barat Jatiuwu	Tangerang		2,500
66	Balaraja Timur	Tangerang		230
67	Desa Mauk, Priok	Tangerang	11	629
68	Kota Bumi Kutajaya, Pasar Kemis	Tangerang	8.33	800
69	Pala Raya Desa Pondok Cabe Udik Pamula	Tangerang	60	1,400
70	Desa Binong,Curug	Tangerang	300	2,000
71	Tol Jakarta Merak Desa Kadu, Curug	Tangerang	218	4,190
72	Raya Binong Curug	Tangerang	30	5,660
73	Serpong	Tangerang	12	
74	Desa Pasar Kemis	Tangerang	15	
75	Batu Ceper	Tangerang	10	450
76	Kec. Cisoka	Tangerang	150	

source: Rumah Untuk Anda 1996
Perumahan Rakyat Di Tahun Emas
Pameran Properti Unggulan

D. Commercial Demand Projection

Survey Sheet of Existing/Potential Customers in Commercial Sector

1.General Information

Company Name	
Type of business	Office, Gov.office, Hotel, Hospital, Shopping mall, School, Restaurant, Other( )
Address/Location	Phone:
Size of Building	m2 (rooms/Hotel, beds/Hospital, tables/Restauran

2.Appliance information

Appliances used	OX	Fuel	Out put	Maximum fuel consumption	Operating time	Peak hour AM	Peak hour PM
Water boiler			kcal/h			from to	from to
Steam boiler			kg/h			from to	from to
Cooking equipment			kcal/h			from to	from to
Air conditioner			Rt			from to	from to
Power generating set			kW			from to	from to
Pollutant disposal equipment			kcal/h			from to	from to
Other						from to	from to
						from to	from to
						from to	from to

3.Fuel information

Fuel used	Average price	Amount of fuel used /year 1992	1993	1994	1995	Maximum Consumption	Main appliances
LPG	Rp/kg					kg/h	
City gas	Rp/m3					m3/h	
Crude oil	Rp/l					l/h	
Heavy oil	Rp/l					l/h	
Kerosene	Rp/l					l/h	
Coal	Rp/kg					kg/h	
Wood	Rp/kg					kg/h	
Electricity	Rp/kW					kW	

4.Air conditioning information

Type of refrigerator	Compression type	Rotary, Reciprocate, Turbo, Screw / Water cooled, Air cooled
	Absorption type	City gas driven, Oil driven, Steam driven
Type of system	Independent, Central	

5.Power generating system information (if installed)

Operation mode	Base load, Peak cut(from to), Emergency
Type of motor	Engine, Turbine
Grid connection	yes, no

6.Opinions

Customer's Opinion on City-Gas Use	
Customer's Opinion on Electricity Use	

Date	Group	Investigater/Sign

Data from the Interview Survey

Category		Size of bldg m2	Cooking Gas equiv m3/y		Boiler Ton	kg/m2	Gas equiv m3/y		Air condition RT	kcal/m2	Power generator kW	W/m2	Operation kW	Gas equi	Demand (PLN) kW	W/m2	Max break even periods	Re.
Office	1	89847	720000	8.01	0	0.000	0	0.00	2700	90.9	4080	45.41	0	0	5600	62.33	5	
	2	89275	3900	0.04	0	0.000	0	0.00	5025	170.2	6000	67.21	0	0	No answer	#VALUE!	3	
	3	50000	4400	0.09	0	0.000	0	0.00	2000	121.0	1600	32.00	0	0	1600	32	5	
	4	39500	36000	0.91	0	0.000	0	0.00	1375	105.3	2000	50.63	0	0	1920	48.61	No answer	
	5	33000	3672	0.11	0	0.000	0	0.00	950	87.1	960	29.09	0	0	755	22.88	No answer	
	6	30841	No answer	#VALUE!	0	0.000	0	0.00	459	45.0	4800	155.64	1200	no answe	1400	45.39	No answer	
	7	29949	36000	1.20	0	0.000	0	0.00	1125	113.6	992	33.12	0	0	1760	58.77	No answer	
	8	27623	No answer	#VALUE!	0	0.000	0	0.00	387	42.4	500	18.10	0	0	2400	86.88	No answer	
	9	27000	0	0.00	0	0.000	0	0.00	1350	151.2	1470	54.44	735	303000	No answer	#VALUE!	No answer	
	10	26921	5600	0.21	0	0.000	0	0.00	1600	179.7	5200	193.16	1200	No answe	4320	160.47	5	
	11	19000	4600	0.24	0	0.000	0	0.00	700	111.4	1080	56.84	0	0	1000	52.63	No answer	
	12	6750	0	0.00	0	0.000	0	0.00	240	107.5	880	130.37	0	0	752	111.41	No answer	
	13	6650	0	0.00	0	0.000	0	0.00	222	101.0	308	46.32	0	0	No answer	#VALUE!	5	
	14	4000	0	0.00	0	0.000	0	0.00	300	226.8	0	0.00	0	0	No answer	#VALUE!	4	
	15	2800	12000	4.29	0	0.000	0	0.00	43	46.4	140	50.00	0	0	No answer	#VALUE!	No answer	army
	16	1500	4200	2.80	0	0.000	0	0.00	17	34.3	0	0.00	0	0	No answer	#VALUE!	No answer	
	17	1500	5400	3.60	0	0.000	0	0.00	19	38.3	0	0.00	0	0	No answer	#VALUE!	No answer	guest house
	18	1000	1200	1.20	0	0.000	0	0.00	35	105.8	0	0.00	0	0	No answer	#VALUE!	No answer	charch
	19	924	180	0.19	0	0.000	0	0.00	32	104.7	0	0.00	0	0	82.5	89.29	5	old bldg
	20	600	790	1.32	0	0.000	0	0.00	18	90.7	0	0.00	0	0	No answer	#VALUE!	No answer	government
	21	200	860	4.30	0	0.000	0	0.00	4.8	72.6	0	0.00	0	0	No answer	#VALUE!	1	old bldg
Ave.				1.50				0.00		102.2		45.83						
Hotel	1	73,000	310000	4.25	14	0.192	982000	13.45	3060	126.8	7300	100.00	2920	1264000	3400	46.58	No answer	
	2	61752	6756	0.11	8	0.130	922000	14.93	1560	76.4	1320	21.38	0	0	2800	45.34	3	
	3	44378	No answer	#VALUE!	No answer	#VALUE!	No answer	#VALUE!	900	61.3	1600	36.05	0	0	2200	49.57	No answer	
	4	42600	182500	4.28	1.5	0.035	182500	4.28	1050	74.5	2000	46.95	0	0	No answer	#VALUE!	No answer	
	5	38716	156000	4.03	5	0.129	624000	16.12	1054	82.3	2800	72.32	0	0	2216	57.24	5	
	6	36800	98674	2.68	2.4	0.065	442000	12.01	931	76.5	400	10.87	0	0	1040	28.26	4	
	7	21000	31025	1.48	3	0.143	145000	6.90	900	129.6	2000	95.24	0	0	2800	133.33	4	
	8	19000	76800	4.04	6	0.316	773500	40.71	850	135.3	750	39.47	0	0	785	41.32	5	
	9	8000	11000	1.38	2	0.250	135000	16.88	200	75.6	184	23.00	0	0	184	23.00	No answer	
	10	4200	16800	4.00	No answer	#VALUE!	No answer	#VALUE!	56	40.3	100	23.81	0	0	332	79.05	5	
	11	3600	2300	0.64	No answer	#VALUE!	No answer	#VALUE!	50	42.0	82	22.78	0	0	No answer	#VALUE!	No answer	
	12	3500	46900	13.40	No answer	#VALUE!	63200	18.06	196	169.3	340	97.14	0	0	No answer	#VALUE!	No answer	

Data from the Interview Survey

Category		Size of bldg m2	Cooking Gas equiv m3/y	Cooking m3/m2.y	Boiler Ton	Boiler kg/m2	Boiler Gas equiv m3/y	Boiler m3/m2.y	Air condition RT	Air condition kcal/m2	Power generator kW	Power generator W/m2	Operation kW	Operation Gas equiv	Demand (PLN) kW	Demand (PLN) W/m2	Max break even periods	Re.
Office	1	89847	720000	8.01	0	0.000	0	0.00	2700	90.9	4080	45.41	0	0	5600	62.33	5	
	2	89275	3900	0.04	0	0.000	0	0.00	5025	170.2	6000	67.21	0	0	No answer	#VALUE!	3	
	3	50000	4400	0.09	0	0.000	0	0.00	2000	121.0	1600	32.00	0	0	1600	32	5	
	4	39500	36000	0.91	0	0.000	0	0.00	1375	105.3	2000	50.63	0	0	1920	48.61	No answer	
	5	33000	3672	0.11	0	0.000	0	0.00	950	87.1	960	29.09	0	0	755	22.88	No answer	
	6	30841	No answer	#VALUE!	0	0.000	0	0.00	459	45.0	4800	155.64	1200	no answe	1400	45.39	No answer	
	7	29949	36000	1.20	0	0.000	0	0.00	1125	113.6	992	33.12	0	0	1760	58.77	No answer	
	8	27623	No answer	#VALUE!	0	0.000	0	0.00	387	42.4	500	18.10	0	0	2400	86.88	No answer	
	9	27000	0	0.00	0	0.000	0	0.00	1350	151.2	1470	54.44	735	303000	No answer	#VALUE!	No answer	
	10	26921	5600	0.21	0	0.000	0	0.00	1600	179.7	5200	193.16	1200	No answe	4320	160.47	5	
	11	19000	4600	0.24	0	0.000	0	0.00	700	111.4	1080	56.84	0	0	1000	52.63	No answer	
	12	6750	0	0.00	0	0.000	0	0.00	240	107.5	880	130.37	0	0	752	111.41	No answer	
	13	6650	0	0.00	0	0.000	0	0.00	222	101.0	308	46.32	0	0	No answer	#VALUE!	5	
	14	4000	0	0.00	0	0.000	0	0.00	300	226.8	0	0.00	0	0	No answer	#VALUE!	4	
	15	2800	12000	4.29	0	0.000	0	0.00	43	46.4	140	50.00	0	0	No answer	#VALUE!	No answer	army
	16	1500	4200	2.80	0	0.000	0	0.00	17	34.3	0	0.00	0	0	No answer	#VALUE!	No answer	
	17	1500	5400	3.60	0	0.000	0	0.00	19	38.3	0	0.00	0	0	No answer	#VALUE!	No answer	guest house
	18	1000	1200	1.20	0	0.000	0	0.00	35	105.8	0	0.00	0	0	No answer	#VALUE!	No answer	charch
	19	924	180	0.19	0	0.000	0	0.00	32	104.7	0	0.00	0	0	82.5	89.29	5	old bldg
	20	600	790	1.32	0	0.000	0	0.00	18	90.7	0	0.00	0	0	No answer	#VALUE!	No answer	government
	21	200	860	4.30	0	0.000	0	0.00	4.8	72.6	0	0.00	0	0	No answer	#VALUE!	1	old bldg
Ave.				1.50				0.00		102.2		45.83						
Hotel	1	73,000	310000	4.25	14	0.192	982000	13.45	3060	126.8	7300	100.00	2920	1264000	3400	46.58	No answer	
	2	61752	6756	0.11	8	0.130	922000	14.93	1560	76.4	1320	21.38	0	0	2800	45.34	3	
	3	44378	No answer	#VALUE!	No answer	#VALUE!	No answer	#VALUE!	900	61.3	1600	36.05	0	0	2200	49.57	No answer	
	4	42600	182500	4.28	1.5	0.035	182500	4.28	1050	74.5	2000	46.95	0	0	No answer	#VALUE!	No answer	
	5	38716	156000	4.03	5	0.129	624000	16.12	1054	82.3	2800	72.32	0	0	2216	57.24	5	
	6	36800	98674	2.68	2.4	0.065	442000	12.01	931	76.5	400	10.87	0	0	1040	28.26	4	
	7	21000	31025	1.48	3	0.143	145000	6.90	900	129.6	2000	95.24	0	0	2800	133.33	4	
	8	19000	76800	4.04	6	0.316	773500	40.71	850	135.3	750	39.47	0	0	785	41.32	5	
	9	8000	11000	1.38	2	0.250	135000	16.88	200	75.6	184	23.00	0	0	184	23.00	No answer	
	10	4200	16800	4.00	No answer	#VALUE!	No answer	#VALUE!	56	40.3	100	23.81	0	0	332	79.05	5	
	11	3600	2300	0.64	No answer	#VALUE!	No answer	#VALUE!	50	42.0	82	22.78	0	0	No answer	#VALUE!	No answer	
	12	3500	46900	13.40	No answer	#VALUE!	63200	18.06	196	169.3	340	97.14	0	0	No answer	#VALUE!	No answer	

	13	3150	8262	2.62	No answer	#VALUE!	No answer	#VALUE!	90	86.4	176	55.87	0	0	120	38.10	4	
	14	2400	4590	1.91	0.01	0.004	No answer	#VALUE!	75	94.5	185	77.08	0	0	160	66.67	5	
Ave.				3.45		0.140		15.93		90.8		51.57						
Hospital	1	115583	449800	3.89	No answer	#VALUE!	189500	1.64	1330	34.8	2005	17.35	0	0	4128	35.71	No answer	
	2	53753	42250	0.79	24	0.446	379000	7.05	676	38.0	975	18.14	0	0	No answer	#VALUE!	No answer	
	3	48337	10500	0.22	15	0.310	255000	5.28	1351	84.5	800	16.55	0	0	1040	21.52	No answer	
	4	32000	63300	1.98	3	0.094	253000	7.91	636	60.1	1125	35.16	0	0	960	30.00	No answer	
	5	15000	24500	1.63	3.5	0.233	384000	25.60	724	146.0	1460	97.33	0	0	2810	187.33	No answer	
	6	12000	14280	1.19	No answer	#VALUE!	227500	18.96	549	138.3	1280	106.67	0	0	1600	133.33	No answer	
	7	10000	10200	1.02	0.1	0.010	No answer	#VALUE!	116	35.1	230	23.00	0	0	186	18.60	4	
	8	4000	3150	0.79	0.01	0.003	No answer	#VALUE!	200	151.2	132	33.00	0	0	No answer	#VALUE!	No answer	
Ave.				1.44		0.183		11.07		86.0		43.40						
Shopping	1	140000	720000	5.14	0	0.000	0	0.00	6000	129.6	12500	89.29	12500	No answe	5000	35.71	5	
	2	83620	No answer	#VALUE!	0	0.000	0	0.00	1850	66.9	2200	26.31	735	960000	3800	45.44	No answer	
	3	46815	136000	2.91	0	0.000	0	0.00	1410	91.1	2960	63.23	0	0	3464	73.99	3	
	4	40000	No answer	#VALUE!	0	0.000	0	0.00	1900	143.6	4000	100.00	0	0	3322	83.05	3	
	5	22000	61000	2.77	0	0.000	0	0.00	900	123.7	2000	90.91	2000	307000	No answer	#VALUE!	2	
	6	15000	23000	1.53	0	0.000	0	0.00	430	86.7	2000	133.33	0	0	No answer	#VALUE!	No answer	
Ave.				3.09				0.00		106.9		83.34						
Restaura	1	1000	6800	6.80	0	0.000	0	0.00	44	133.1	9	9.00	9	No answe	33	33.00	5	
	2	1000	13800	13.80	0	0.000	0	0.00	26	78.6		0.00	0	0	No answer	#VALUE!	1	
	3	950	150000	157.89	0	0.000	0	0.00	64	203.7	480	505.26	0	0	No answer	#VALUE!	No answer	
	4	900	61600	68.44	0	0.000	0	0.00	21	70.6	724	804.44	700	40400	400	444.44	4	
	5	800	82620	103.28	0	0.000	0	0.00	60	226.8	200	250.00	0	0	No answer	#VALUE!	No answer	
	6	500	74400	148.80	0	0.000	0	0.00	8	48.4	0	0.00	0	0	No answer	#VALUE!	2	
	7	500	36700	73.40	0	0.000	0	0.00	27	163.3	0	0.00	0	0	No answer	#VALUE!	5	
	8	500	17575	35.15	0	0.000	0	0.00	3	18.1	0	0.00	0	0	16	32.00	No answer	
	9	368	86800	235.87	0	0.000	0	0.00	6	49.3	8	21.74	0	0	33	89.67	No answer	
	10	160	5500	34.38	0	0.000	0	0.00	12	226.8	0	0.00	0	0	66	412.50	No answer	
	11	150	13770	91.80	0	0.000	0	0.00	12	241.9	0	0.00	0	0	51	340.00	No answer	
	12	150	2070	13.80	0	0.000	0	0.00	20	403.2	0	0.00	0	0	88	586.67	No answer	
	13	90	6400	71.11	0	0.000	0	0.00	5	168.0	0	0.00	0	0	11	122.22	No answer	
Ave.				81.12		0.000		0.00		156.3		122.34				257.56		
Laborato	1	8965	180		0	0.000	0	0.00	0.8	0.3	0	0.00	0	0	25.2	2.81	No answer	High school
	2	3500	46900	13.40	1	0.286	63000	18.00	240	207.4	420	120.00	0	0	300	85.71	No answer	
Ave.																		

	13	3150	8262	2.62	No answer	#VALUE!	No answer	#VALUE!	90	86.4	176	55.87	0	0	120	38.10	4	
	14	2400	4590	1.91	0.01	0.004	No answer	#VALUE!	75	94.5	185	77.08	0	0	160	66.67	5	
Ave.				3.45		0.140		15.93		90.8		51.57						
Hospital	1	115583	449800	3.89	No answer	#VALUE!	189500	1.64	1330	34.8	2005	17.35	0	0	4128	35.71	No answer	
	2	53753	42250	0.79	24	0.446	379000	7.05	676	38.0	975	18.14	0	0	No answer	#VALUE!	No answer	
	3	48337	10500	0.22	15	0.310	255000	5.28	1351	84.5	800	16.55	0	0	1040	21.52	No answer	
	4	32000	63300	1.98	3	0.094	253000	7.91	636	60.1	1125	35.16	0	0	960	30.00	No answer	
	5	15000	24500	1.63	3.5	0.233	384000	25.60	724	146.0	1460	97.33	0	0	2810	187.33	No answer	
	6	12000	14280	1.19	No answer	#VALUE!	227500	18.96	549	138.3	1280	106.67	0	0	1600	133.33	No answer	
	7	10000	10200	1.02	0.1	0.010	No answer	#VALUE!	116	35.1	230	23.00	0	0	186	18.60	4	
	8	4000	3150	0.79	0.01	0.003	No answer	#VALUE!	200	151.2	132	33.00	0	0	No answer	#VALUE!	No answer	
Ave.				1.44		0.183		11.07		86.0		43.40						
Shopping	1	140000	720000	5.14	0	0.000	0	0.00	6000	129.6	12500	89.29	12500	No answe	5000	35.71	5	
	2	83620	No answer	#VALUE!	0	0.000	0	0.00	1850	66.9	2200	26.31	735	960000	3800	45.44	No answer	
	3	46815	136000	2.91	0	0.000	0	0.00	1410	91.1	2960	63.23	0	0	3464	73.99	3	
	4	40000	No answer	#VALUE!	0	0.000	0	0.00	1900	143.6	4000	100.00	0	0	3322	83.05	3	
	5	22000	61000	2.77	0	0.000	0	0.00	900	123.7	2000	90.91	2000	307000	No answer	#VALUE!	2	
	6	15000	23000	1.53	0	0.000	0	0.00	430	86.7	2000	133.33	0	0	No answer	#VALUE!	No answer	
Ave.				3.09				0.00		106.9		83.84						
Restaura	1	1000	6800	6.80	0	0.000	0	0.00	44	133.1	9	9.00	9	No answe	33	33.00	5	
	2	1000	13800	13.80	0	0.000	0	0.00	26	78.6		0.00	0	0	No answer	#VALUE!	1	
	3	950	150000	157.89	0	0.000	0	0.00	64	203.7	480	505.26	0	0	No answer	#VALUE!	No answer	
	4	900	61600	68.44	0	0.000	0	0.00	21	70.6	724	804.44	700	40400	400	444.44	4	
	5	800	82620	103.28	0	0.000	0	0.00	60	226.8	200	250.00	0	0	No answer	#VALUE!	No answer	
	6	500	74400	148.80	0	0.000	0	0.00	8	48.4	0	0.00	0	0	No answer	#VALUE!	2	
	7	500	36700	73.40	0	0.000	0	0.00	27	163.3	0	0.00	0	0	No answer	#VALUE!	5	
	8	500	17575	35.15	0	0.000	0	0.00	3	18.1	0	0.00	0	0	16	32.00	No answer	
	9	368	86800	235.87	0	0.000	0	0.00	6	49.3	8	21.74	0	0	33	89.67	No answer	
	10	160	5500	34.38	0	0.000	0	0.00	12	226.8	0	0.00	0	0	66	412.50	No answer	
	11	150	13770	91.80	0	0.000	0	0.00	12	241.9	0	0.00	0	0	51	340.00	No answer	
	12	150	2070	13.80	0	0.000	0	0.00	20	403.2	0	0.00	0	0	88	586.67	No answer	
	13	90	6400	71.11	0	0.000	0	0.00	5	168.0	0	0.00	0	0	11	122.22	No answer	
Ave.				81.12		0.000		0.00		156.3		122.34				257.56		
Laborato	1	8965	180		0	0.000	0	0.00	0.8	0.3	0	0.00	0	0	25.2	2.81	No answer	High school
	2	3500	46900	13.40	1	0.286	63000	18.00	240	207.4	420	120.00	0	0	300	85.71	No answer	
Ave:																		

Open Hours from the Questionnaire Survey

Office			
	O	~	C
1	9		18
2	8		17
3	7		17
4	8		17
5	8		17
6	9		17
7	7		17
8	10		18
9	8		17
10	7		15
11	7		20
12	7		17
13	7		17
14	5		17
15	8		16
16	8		22
17	8		17
18	10		22
19	7		17
20	7		17
21	9		17
22	6		17
23	10		21
24	7		20
25	8		17
26	9		17
27	7		17
28	7		17
29	7		17
S	224		512
A	8		18

Hotel			
	O	~	C
1	5		22
2	4		18
3	0		24
4	0		24
5	0		24
6	0		24
7	0		24
S	9		160
A	1		23

Hospital			
	O	~	C
1	6		19
2	5		19
3	6		18
4	0		24
5	6		17
S	23		97
A	5		19

Sopping			
	O	~	C
1	8		24
2	7		22
3	9		17
4	7		20
S	31		83
A	8		21

Restaurant			
	O	~	C
1	10		24
2	10		22
3	10		20
4	8		20
5	6		20
6	9		16
7	9		20
8	10		20
9	9		18
10	10		24
11	10		24
12	7		22
13	4		22
14	10		25
15	7		20
16	7		20
17	9		24
18	10		24
19	9		22
20	9		22
S	173		429
A	9		21

Laboratory			
	O	~	C
1	7		16
2	7		16
3	7		17
4	7		16
S	28		65
A	7		16

Office : 10 hours/day
Hotel : 22 hours/day (A.C : 24 hour/day)
Hospital : 14 hours/day (A.C. : 24 hour/day)
Sopping : 13 hours/day
Restaurant : 12 hours/day
Laboratory : 9 hours/day

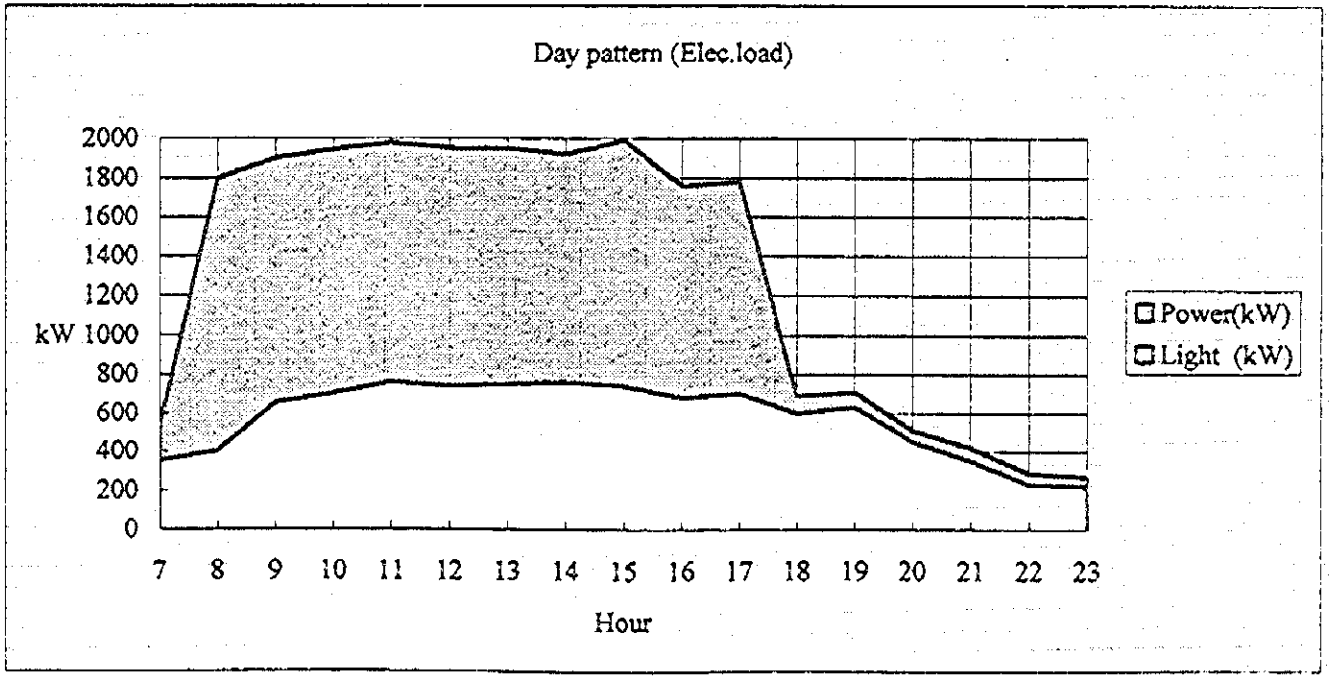
Load Pattern of Electricity for Air Conditioner

Typical day time operation building

M-Office

39500m2, 1375RT(Water cooled package air conditioner), PLN Demand 2,400KVA

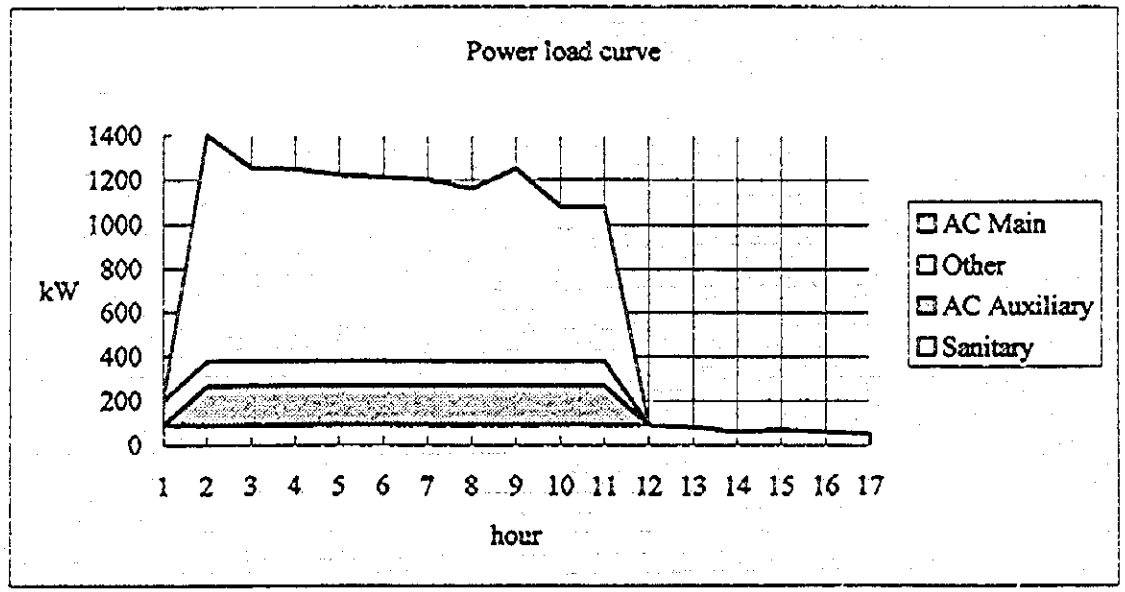
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Light (kW	350	400	650	700	760	740	750	760	740	680	700	600	630	450	350	230	220	9710
Power(kW	200	1400	1250	1245	1220	1210	1200	1160	1250	1080	1080	90	80	60	70	60	50	12705
Total (kW	550	1800	1900	1945	1980	1950	1950	1920	1990	1760	1780	690	710	510	420	290	270	22415



	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Power(kW)	200	1400	1250	1245	1220	1210	1200	1160	1250	1080	1080	90	80	60	70	60	50	12705
Sanitary	90	90	90	90	90	90	90	90	90	90	90	90	80	60	70	60	50	1400
AC Auxilia	0	180	180	180	180	180	180	180	180	180	180	0	0	0	0	0	0	1800
Other	110	110	110	110	110	110	110	110	110	110	110	0	0	0	0	0	0	1210
AC Main	0	1020	870	865	840	830	820	780	870	700	700	0	0	0	0	0	0	8295

AC Load rate: 8295kWh/(1375RT*0.9kW/RT*10hour) = 0.67 % (10 hour/d*360 d/y)

AC Annual Full Rate Hour: 8295kWh/(1375RT*0.9kW/RT)*360 = 2413 Hour



Load Pattern of Electricity for Air Conditioner

Typical 24 hour operation building

P-Hotel 19,000m2, 700RT(Water cooled Turbo chiller)

Dry season (A)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
1	320	320	0	0	400	270	360	360	360	360	380	400	400	460	460	450	450	450	450	450	450	375	340	350	8615
2	260	250	250	275	300	350	390	400	420	450	430	475	470	470	470	460	400	400	400	400	400	350	300	320	9090
3	280	280	280	0	0	300	420	420	420	460	460	475	475	500	490	470	400	450	400	400	400	375	300	300	8755
Ave	287	283	177	92	233	307	390	393	400	423	423	450	448	477	473	460	417	433	417	417	417	367	313	323	8820

Rainy season (A)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
1	270	270	260	240	220	280	400	400	430	460	470	460	440	450	575	575	575	600	590	570	550	550	300	350	10285
2	300	280	280	0	450	300	375	400	400	650	650	650	650	650	640	600	560	320	420	360	380	380	320	300	10315
3	290	280	280	280	300	320	400	400	380	400	400	400	410	400	400	400	400	370	350	350	350	350	350	300	8560
Ave	287	277	273	173	323	300	392	400	403	503	507	503	500	500	538	525	512	430	453	427	427	427	323	317	9720

kW (380V*A*1.732/1000)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
D	170	168	105	54	138	182	231	233	237	251	251	267	266	282	280	272	247	257	247	247	247	217	186	192	5224
R	170	164	162	103	192	178	232	237	239	298	300	298	296	296	319	311	303	255	269	253	253	253	192	188	5758
																								Ave.	5491

AC Load rate : 15,120kWh/(700RT*0.9kW/RT*24hour) = 5491/15120= 0.36 %

AC Annual Full Rate Hour : 5.491kWh/(700RT*0.9kW/RT)*360 = 3,138 hour

Regional Development Located Near the Existing Pipeline

Area	Name of development	Average ha	Office (m2)	Hotel (m2)	Hospital (m2)	Shopping (m2)
North Tangerang	Lippo Virage	1,000	29,000	26,000	32,000	81,000
	Modern Land	1,000	29,000	26,000	32,000	81,000
	Gading Surpong	1,000	29,000	26,000	32,000	81,000
	Bintaro Jaya	1,000	29,000	26,000	32,000	81,000
	Bumi Serpong Damai	3,000	1,947,200	48,000	23,040	1,229,440
	Citraraya Tangerang	2,000	58000	52000	64000	162000
	Kota Tigaraksa	3,000	87000	78000	96000	243000
	Villa Permata	750	21,750	19,500	24,000	60,750
	Alam Sutera	750	21,750	19,500	24,000	60,750
	Banjar Wijaya	750	21,750	19,500	24,000	60,750
	Citra Garden	375	10,875	9,750	12,000	30,375
	Kebayoran Regency	375	10,875	9,750	12,000	30,375
	Kedaton	175	5,075	4,550	5,600	14,175
	Palm Spring Village	175	5,075	4,550	5,600	14,175
	Royyal Green Garden	175	5,075	4,550	5,600	14,175
	Villa Melati Mas	175	5,075	4,550	5,600	14,175
	Cipondoh Makmur	75	2,175	1,950	2,400	6,075
	Duta Taman Bandara	75	2,175	1,950	2,400	6,075
	Duta Garden	75	2,175	1,950	2,400	6,075
	Metro Permata	75	2,175	1,950	2,400	6,075
	Total(N.T.)	16,000	2,324,200	386,000	439,040	2,282,440
North West DKI	Pantai Indah Kapuk	1,000	29,000	26,000	32,000	81,000
	Vila Taman Bandara	175	5,075	4,550	5,600	14,175
	Taman Surya	175	5,075	4,550	5,600	14,175
	Permata Hijau Regen	175	5,075	4,550	5,600	14,175
	Puri Indah	175	5,075	4,550	5,600	14,175
	Green Garden	175	5,075	4,550	5,600	14,175
	Pantai Mutiara	175	5,075	4,550	5,600	14,175
	Kosambi Baru	75	2,175	1,950	2,400	6,075
	Taman Semanan Inda	75	2,175	1,950	2,400	6,075
	Palm View Garden	75	2,175	1,950	2,400	6,075
	Taman Kencana	75	2,175	1,950	2,400	6,075
	Green Ville	75	2,175	1,950	2,400	6,075
	Total(N.W.DKI)	2,425	70,325	63,050	77,600	196,425
North East DKI	Sunter Agung Podom	750	21,750	19,500	24,000	60,750
	Gading Kirana	750	21,750	19,500	24,000	60,750
	Kelapa Gading	750	21,750	19,500	24,000	60,750
	Pantai Modern	750	21,750	19,500	24,000	60,750
	Harapan Indah	750	21,750	19,500	24,000	60,750
	Taman Impian Estate	375	10,875	9,750	12,000	30,375
	Sunter Paradise	75	2,175	1,950	2,400	6,075
	Total(N.E.DKI)	4,200	121,800	109,200	134,400	340,200
Central Bekasi	Kota Legenda	1,000	29,000	26,000	32,000	81,000
	Lippo City	1,000	29,000	26,000	32,000	81,000
	Cikarang baru	750	21,750	19,500	24,000	60,750
	Jakamulya	175	5,075	4,550	5,600	14,175
	Kumang Pratama	175	5,075	4,550	5,600	14,175
	Taman Galaxy Indahi	75	2,175	1,950	2,400	6,075
	Pondok Pekayon Inda	75	2,175	1,950	2,400	6,075
	Taman Naragong Ind	75	2,175	1,950	2,400	6,075
	Jatimulya Jaya	75	2,175	1,950	2,400	6,075
	Sentosa Garden	75	2,175	1,950	2,400	6,075
	Total(C.B.)	3,475	100,775	90,350	111,200	281,475
Grand Total		26,100	2,617,100	648,600	762,240	3,100,540

Forecast of New Construction in DKI in Each Case (Floor area m2)

		1991	1992	1993	1994	1995	2000	2005	2010	2015	2020
Base Case	Office	2,335,588	3,241,284	3,594,916	4,108,280	3,320,017	4,161,155	5,200,460	6,499,346	8,192,802	10,327,503
	Hotel	528,587	242,316	269,464	359,177	349,886	438,531	548,060	684,945	863,413	1,088,383
	hospital	158,027	31,948	39,650	59,369	72,249	90,553	113,170	141,435	178,288	224,742
	Shopping	887,320	393,234	403,961	583,047	566,891	710,514	887,975	1,109,759	1,398,915	1,763,414
	Total	3,909,522	3,908,782	4,307,991	5,109,873	4,309,042	5,400,753	6,749,664	8,435,485	10,633,418	13,404,041
High Case	Office	2,335,588	3,241,284	3,594,916	4,108,280	3,320,017	4,209,103	5,366,887	6,843,137	9,235,680	12,464,718
	Hotel	528,587	242,316	269,464	359,177	349,886	443,584	565,599	721,176	973,319	1,313,617
	hospital	158,027	31,948	39,650	59,369	72,249	91,596	116,791	148,917	200,982	271,251
	Shopping	887,320	393,234	403,961	583,047	566,891	718,701	916,392	1,168,461	1,576,986	2,128,342
	Total	3,909,522	3,908,782	4,307,991	5,109,873	4,309,042	5,462,985	6,965,669	8,881,691	11,986,966	16,177,928
Low Case	Office	2,335,588	3,241,284	3,594,916	4,108,280	3,320,017	4,113,645	5,009,692	6,100,919	7,134,653	8,343,543
	Hotel	528,587	242,316	269,464	359,177	349,886	433,524	527,955	642,956	751,898	879,299
	hospital	158,027	31,948	39,650	59,369	72,249	89,519	109,018	132,765	155,261	181,568
	Shopping	887,320	393,234	403,961	583,047	566,891	702,402	855,401	1,041,728	1,218,237	1,424,654
	Total	3,909,522	3,908,782	4,307,991	5,109,873	4,309,042	5,339,089	6,502,067	7,918,368	9,260,049	10,829,064

Marketable Gas Sales for Cooking in Base Case in DKI

m3/y=m2*(Pipeline density)*(Marketable gas sales per unit area)

Year	Pipeline density	Office 1.50m3/m2.y	Hotel 3.45m3/m2.y	Hospital 1.44m3/m2.y	Shopping 3.09m3/m2.y	Total
5	0.16	1,248,110	302,529	26,074	439,015	2,015,728
6	0.165	1,345,806	326,210	28,115	473,379	2,173,510
7	0.17	1,449,817	351,421	30,288	509,964	2,341,489
8	0.175	1,560,514	378,253	32,601	548,901	2,520,269
9	0.18	1,678,293	406,801	35,061	590,329	2,710,484
10	0.185	1,803,568	437,166	37,678	634,393	2,912,807
11	0.19	1,940,113	470,263	40,531	682,422	3,133,330
12	0.195	2,085,550	505,516	43,569	733,579	3,368,214
13	0.2	2,240,416	543,054	46,805	788,052	3,618,325
14	0.205	2,405,277	583,014	50,249	846,040	3,884,580
15	0.21	2,580,733	625,543	53,914	907,756	4,167,946
16	0.215	2,767,418	670,794	57,814	973,421	4,469,447
17	0.22	2,966,003	718,928	61,963	1,043,272	4,790,166
18	0.225	3,177,196	770,119	66,375	1,117,558	5,131,248
19	0.23	3,401,746	824,548	71,066	1,196,542	5,493,902
20	0.235	3,640,445	882,406	76,053	1,280,503	5,879,406

Marketable Gas Sales for Cooking in High Case in DKI

Year	Pipeline density	Office 1.50m3/m2.y	Hotel 3.45m3/m2.y	Hospital 1.44m3/m2.y	Shopping 3.09m3/m2.y	Total
5	0.16	1,288,053	312,211	26,909	453,064	2,080,236
6	0.165	1,394,454	338,001	29,132	490,490	2,252,077
7	0.17	1,508,258	365,586	31,509	530,520	2,435,874
8	0.175	1,629,939	395,080	34,051	573,321	2,632,391
9	0.18	1,759,999	426,606	36,768	619,068	2,842,441
10	0.185	1,898,971	460,291	39,671	667,951	3,066,884
11	0.19	2,070,822	501,946	43,262	728,398	3,344,428
12	0.195	2,256,662	546,992	47,144	793,766	3,644,564
13	0.2	2,457,563	595,688	51,341	864,432	3,969,024
14	0.205	2,674,677	648,314	55,877	940,800	4,319,667
15	0.21	2,909,239	705,169	60,777	1,023,306	4,698,492
16	0.215	3,162,578	766,576	66,070	1,112,416	5,107,641
17	0.22	3,436,119	832,880	71,784	1,208,633	5,549,416
18	0.225	3,731,391	904,451	77,953	1,312,493	6,026,287
19	0.23	4,050,036	981,687	84,609	1,424,574	6,540,906
20	0.235	4,393,813	1,065,015	91,791	1,545,495	7,096,115

Marketable Gas Sales for Cooking in Low Case in DKI

Year	Pipeline density	Office 1.50m3/m2.y	Hotel 3.45m3/m2.y	Hospital 1.44m3/m2.y	Shopping 3.09m3/m2.y	Total
5	0.16	1,202,326	291,431	25,118	422,910	1,941,786
6	0.165	1,289,743	312,620	26,944	453,659	2,082,966
7	0.17	1,382,245	335,042	28,877	486,196	2,232,358
8	0.175	1,480,099	358,761	30,921	520,615	2,390,396
9	0.18	1,583,588	383,845	33,083	557,017	2,557,533
10	0.185	1,693,005	410,367	35,369	595,504	2,734,244
11	0.19	1,794,055	434,860	37,480	631,047	2,897,442
12	0.195	1,899,819	460,496	39,689	668,249	3,068,253
13	0.2	2,010,495	487,323	42,001	707,179	3,246,999
14	0.205	2,126,290	515,391	44,420	747,909	3,434,010
15	0.21	2,247,416	544,750	46,951	790,514	3,629,631
16	0.215	2,374,095	575,456	49,597	835,073	3,834,221
17	0.22	2,506,559	607,564	52,365	881,666	4,048,153
18	0.225	2,645,046	641,132	55,258	930,378	4,271,813
19	0.23	2,789,806	676,220	58,282	981,296	4,505,605
20	0.235	2,941,099	712,892	61,443	1,034,512	4,749,946

Marketable Size of Boiler in Base Case in DKI

Marketable size=Total Ton*Rate of Penetration*Pipe line der

Year	Pipe line density	Hotel ROP=0.85	Hospital ROP=0.4	Total
5	0.16	10.4	1.3	11.8
6	0.165	11.3	1.4	12.7
7	0.17	12.1	1.5	13.7
8	0.175	13.0	1.7	14.7
9	0.18	14.0	1.8	15.8
10	0.185	15.1	1.9	17.0
11	0.19	16.2	2.1	18.3
12	0.195	17.4	2.2	19.7
13	0.2	18.7	2.4	21.1
14	0.205	20.1	2.6	22.7
15	0.21	21.6	2.7	24.3
16	0.215	23.1	2.9	26.1
17	0.22	24.8	3.1	27.9
18	0.225	26.6	3.4	29.9
19	0.23	28.4	3.6	32.1
20	0.235	30.4	3.9	34.3

Gas Sales for Boiler in DKI in Base Case

Gas sales = 75.43*Annual full rate hours

Year	Hotel 1508.5 h	Hospital 801.96 h	Total
5	1,187,365	80,179	1,267,544
6	1,280,306	86,455	1,366,761
7	1,379,255	93,136	1,472,391
8	1,484,565	100,247	1,584,812
9	1,596,611	107,813	1,704,425
10	1,715,789	115,861	1,831,651
11	1,845,689	124,633	1,970,321
12	1,984,047	133,976	2,118,023
13	2,131,376	143,924	2,275,300
14	2,288,213	154,515	2,442,728
15	2,455,130	165,786	2,620,916
16	2,632,729	177,779	2,810,508
17	2,821,649	190,536	3,012,185
18	3,022,563	204,103	3,226,666
19	3,236,184	218,528	3,454,712
20	3,463,266	233,862	3,697,128

Marketable Size of Boiler in High Case in DKI

5	0.16	10.8	1.4	12.1
6	0.165	11.7	1.5	13.1
7	0.17	12.6	1.6	14.2
8	0.175	13.6	1.7	15.4
9	0.18	14.7	1.9	16.6
10	0.185	15.9	2.0	17.9
11	0.19	17.3	2.2	19.5
12	0.195	18.9	2.4	21.3
13	0.2	20.5	2.6	23.2
14	0.205	22.4	2.8	25.2
15	0.21	24.3	3.1	27.4
16	0.215	26.4	3.4	29.8
17	0.22	28.7	3.6	32.4
18	0.225	31.2	4.0	35.2
19	0.23	33.9	4.3	38.2
20	0.235	36.7	4.7	41.4

Gas Sales for Boiler in DKI in High Case

5	1,225,364	82,744	1,308,108
6	1,326,586	89,580	1,416,166
7	1,434,852	96,890	1,531,742
8	1,550,611	104,707	1,655,318
9	1,674,341	113,062	1,787,403
10	1,806,549	121,990	1,928,538
11	1,970,036	133,030	2,103,066
12	2,146,831	144,968	2,291,799
13	2,337,955	157,874	2,495,828
14	2,544,501	171,821	2,716,322
15	2,767,648	186,889	2,954,537
16	3,008,657	203,164	3,211,821
17	3,268,885	220,736	3,489,621
18	3,549,786	239,704	3,789,490
19	3,852,922	260,174	4,113,096
20	4,179,968	282,258	4,462,226

Marketable Size of Boiler in Low Case in DKI

5	0.16	10.1	1.3	11.3
6	0.165	10.8	1.4	12.2
7	0.17	11.6	1.5	13.0
8	0.175	12.4	1.6	13.9
9	0.18	13.2	1.7	14.9
10	0.185	14.2	1.8	16.0
11	0.19	15.0	1.9	16.9
12	0.195	15.9	2.0	17.9
13	0.2	16.8	2.1	18.9
14	0.205	17.8	2.3	20.0
15	0.21	18.8	2.4	21.2
16	0.215	19.8	2.5	22.4
17	0.22	21.0	2.7	23.6
18	0.225	22.1	2.8	24.9
19	0.23	23.3	3.0	26.3
20	0.235	24.6	3.1	27.7

Gas Sales for Boiler in DKI in Low Case

5	1,143,809	77,237	1,221,047
6	1,226,971	82,853	1,309,824
7	1,314,971	88,795	1,403,767
8	1,408,064	95,082	1,503,145
9	1,506,515	101,730	1,608,245
10	1,610,607	108,759	1,719,366
11	1,706,739	115,250	1,821,989
12	1,807,355	122,044	1,929,400
13	1,912,645	129,154	2,041,800
14	2,022,804	136,593	2,159,397
15	2,138,035	144,374	2,282,409
16	2,258,549	152,512	2,411,061
17	2,384,565	161,021	2,545,587
18	2,516,313	169,918	2,686,230
19	2,654,028	179,217	2,833,245
20	2,797,957	188,936	2,986,893

Marketable Size of Air Con. in Base Case in DKI

Marketable size=Total RT*Rate of Penetration*Pipe line density*C/I Ratio

Year	Pipe line density	Office	Hotel	Hospital	Shopping	GIIP	Total (RT)
5	0.16	11,331	2,226	234	4,150	457	17,941
6	0.165	12,218	2,400	252	4,475	492	19,345
7	0.17	13,162	2,585	271	4,821	530	20,840
8	0.175	14,167	2,783	292	5,189	571	22,431
9	0.18	15,237	2,993	314	5,580	614	24,124
10	0.185	16,374	3,216	338	5,997	660	25,925
11	0.19	17,614	3,460	363	6,451	710	27,887
12	0.195	18,934	3,719	390	6,935	763	29,978
13	0.2	20,340	3,995	419	7,450	820	32,204
14	0.205	21,837	4,289	450	7,998	880	34,574
15	0.21	23,430	4,602	483	8,581	944	37,096
16	0.215	25,125	4,935	518	9,202	1,013	39,779
17	0.22	26,927	5,289	555	9,862	1,085	42,634
18	0.225	28,845	5,665	595	10,564	1,163	45,669
19	0.23	30,883	6,066	637	11,311	1,245	48,897
20	0.235	33,050	6,491	682	12,105	1,332	52,328

Gas Sales for Air Con. in Base Case in DKI

Gas sales = 0.313*Annual full rate hours

Year	Office 2010 h	Hotel 3110.4 h	Hospital 3110.4 h	Shopping 3135.6 h	Total
5	7,812,066	2,374,379	249,297	4,463,459	14,899,201
6	8,423,555	2,560,233	268,811	4,812,836	16,065,435
7	9,074,568	2,758,100	289,586	5,184,796	17,307,050
8	9,767,438	2,968,689	311,697	5,580,670	18,628,494
9	10,504,629	3,192,749	335,222	6,001,867	20,034,467
10	11,288,741	3,431,070	360,244	6,449,873	21,529,928
11	12,143,390	3,690,830	387,518	6,938,181	23,159,918
12	13,053,697	3,967,506	416,567	7,458,289	24,896,059
13	14,023,018	4,262,119	447,500	8,012,115	26,744,751
14	15,054,901	4,575,747	480,429	8,601,686	28,712,764
15	16,153,101	4,909,531	515,475	9,229,148	30,807,255
16	17,321,586	5,264,677	552,763	9,896,766	33,035,793
17	18,564,551	5,642,461	592,428	10,606,940	35,406,380
18	19,886,431	6,044,229	634,612	11,362,202	37,927,475
19	21,291,916	6,471,409	679,464	12,165,232	40,608,020
20	22,785,960	6,925,505	727,141	13,018,861	43,457,467

Marketable Size of Air Con. in High Case in DKI

5	0.16	11,694	2,297	241	4,283	471	18,515
6	0.165	12,660	2,487	261	4,637	510	20,044
7	0.17	13,693	2,689	282	5,015	552	21,680
8	0.175	14,798	2,906	305	5,420	596	23,429
9	0.18	15,978	3,138	330	5,852	644	25,298
10	0.185	17,240	3,386	356	6,314	695	27,295
11	0.19	18,800	3,693	388	6,886	758	29,766
12	0.195	20,488	4,024	422	7,504	826	32,438
13	0.2	22,311	4,382	460	8,172	899	35,325
14	0.205	24,283	4,769	501	8,894	979	38,446
15	0.21	26,412	5,188	545	9,673	1,064	41,818
16	0.215	28,712	5,639	592	10,516	1,157	45,459
17	0.22	31,195	6,127	643	11,425	1,257	49,391
18	0.225	33,876	6,654	699	12,407	1,365	53,636
19	0.23	36,769	7,222	758	13,467	1,482	58,216
20	0.235	39,890	7,835	823	14,610	1,608	63,157

Gas Sales for Air Con. in High Case in DKI

5	8,062,070	2,450,364	257,275	4,606,300	15,376,009
6	8,728,047	2,652,780	278,528	4,986,809	16,646,163
7	9,440,361	2,869,279	301,259	5,393,793	18,004,692
8	10,201,976	3,100,762	325,564	5,828,945	19,457,247
9	11,016,036	3,348,185	351,542	6,294,062	21,009,824
10	11,885,874	3,612,561	379,300	6,791,048	22,668,783
11	12,961,514	3,939,488	413,625	7,405,619	24,720,247
12	14,124,707	4,293,026	450,745	8,070,215	26,938,694
13	15,382,168	4,675,216	490,873	8,788,671	29,336,928
14	16,741,106	5,088,248	534,239	9,565,107	31,928,699
15	18,209,260	5,534,475	581,090	10,403,943	34,728,768
16	19,794,940	6,016,422	631,692	11,309,928	37,752,983
17	21,507,064	6,536,800	686,329	12,288,158	41,018,352
18	23,355,205	7,098,520	745,307	13,344,102	44,543,134
19	25,349,636	7,704,702	808,953	14,483,629	48,346,920
20	27,501,379	8,358,697	877,619	15,713,037	52,450,732

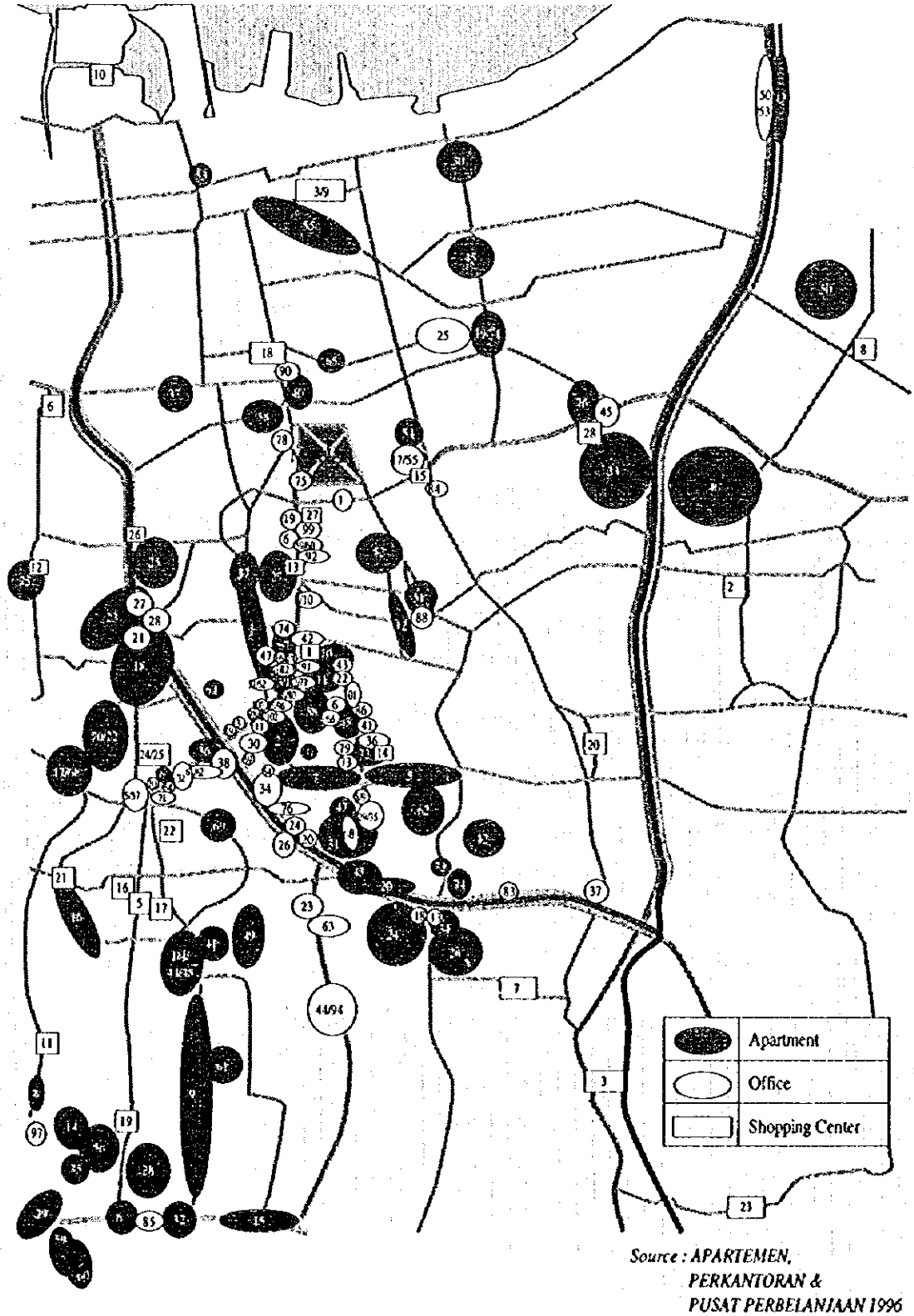
Marketable Size of Air Con. in Low Case in DKI

5	0.16	10,916	2,144	225	3,998	440	17,282
6	0.165	11,709	2,300	241	4,289	472	18,539
7	0.17	12,549	2,465	259	4,596	506	19,869
8	0.175	13,437	2,639	277	4,921	542	21,275
9	0.18	14,377	2,824	296	5,266	579	22,763
10	0.185	15,370	3,019	317	5,629	619	24,335
11	0.19	16,288	3,199	336	5,965	656	25,788
12	0.195	17,248	3,388	356	6,317	695	27,308
13	0.2	18,253	3,585	376	6,685	736	28,899
14	0.205	19,304	3,791	398	7,070	778	30,564
15	0.21	20,404	4,007	421	7,473	822	32,305
16	0.215	21,554	4,233	444	7,894	869	34,126
17	0.22	22,756	4,470	469	8,335	917	36,030
18	0.225	24,014	4,717	495	8,795	968	38,020
19	0.23	25,328	4,975	522	9,276	1,021	40,101
20	0.235	26,701	5,244	551	9,779	1,076	42,276

Gas Sales for Air Con. in Low Case in DKI

5	7,525,496	2,287,280	240,152	4,299,726	14,352,654
6	8,072,647	2,453,579	257,613	4,612,343	15,396,182
7	8,651,627	2,629,553	276,089	4,943,146	16,500,415
8	9,264,111	2,815,710	295,635	5,293,092	17,668,547
9	9,911,858	3,012,584	316,305	5,663,185	18,903,932
10	10,596,712	3,220,737	338,160	6,054,479	20,210,089
11	11,229,193	3,412,971	358,344	6,415,850	21,416,358
12	11,891,183	3,614,175	379,469	6,794,081	22,678,908
13	12,583,921	3,824,724	401,576	7,189,880	24,000,100
14	13,308,692	4,045,009	424,704	7,603,981	25,382,386
15	14,066,833	4,275,436	448,898	8,037,148	26,828,315
16	14,859,733	4,516,428	474,201	8,490,176	28,340,538
17	15,688,837	4,768,424	500,659	8,963,888	29,921,808
18	16,555,645	5,031,879	528,321	9,459,143	31,574,988
19	17,461,717	5,307,268	557,235	9,976,831	33,303,052
20	18,408,674	5,595,084	587,454	10,517,879	35,109,091

Apartments, Offices and Shopping Centers



Source : APARTEMEN, PERKANTORAN & PUSAT PERBELANJAAN 1996

OFFICE SPACE DIRECTORY

1. Adhi Garha
2. Anggana Danamon
3. BRI II
4. Bank Bumi Daya Plaza
5. Bank Panin Pusat
6. Bank Surya Building
7. Bimantara Tower
8. Bina Milia I
9. Bina Mulia II
10. Bumi Daya Plaza
11. Central Plaza
12. Chase Plaza
13. Five Pillar Office Park
14. Gapuramas
15. Gedung Artha Graha
16. Gedung Arthaloka
17. Gedung Bunas
18. Gedung Eka Life
19. Gedung Jaya
20. Gedung Lippo Jiwa
21. Gedung Manggala Wanabhakti
22. Gedung Menara Duta
23. Gedung Multika
24. Gedung Patra
25. Gedung Pekaka
26. Gedung Tifa
27. Gedung Wisma Bisnis Indonesia
28. Graha Interior & Arsitektur (JDC)
29. Graha Irama
30. Graha Kirana
31. Graha Niaga I
32. Graha Niaga II
33. Graha Thata
34. Graha Unilever
35. Granadha
36. Great River Tower
37. Griya Savitri
38. Jakarta Stock Exchange Building
39. Kodel House
40. Kuningan Office Park
41. Kuningan Plaza
42. Landmark Tower A
43. Lippo Life Building
44. Mampang Graha
45. Mega ITC Cempaka Mas
46. Menara BCD
47. Menara Betawi
48. Menara Gajah Mada
49. Menara Sudirman
50. Menara Sahid
51. Midplaza 2
52. Midplaza 1
53. Mitra Sunter
54. Mulia Tower
55. Oasis Mitra Sarana/Menara Era
56. Panin Bank Building
57. Panin Bank Center
58. Plaza 89
59. Plaza BII Tower 2
60. Plaza BII Tower 3
61. Plaza Bapindo 1
62. Plaza Bapindo 2
63. Plaza Basmar
64. Plaza Lippo
65. Plaza Mashill
66. Plaza Setia Budi 1
67. Plaza Setia Budi 2
68. Price Waterhouse Center
69. Puri Exim
70. Ratu Plaza Office Tower
71. S. Widjojo Center
72. Senayan Square Tower 1
73. Sentra Mulia
74. Wisma 46
75. Wisma Antara
76. Wisma Argo Manunggal
77. Wisma BCA
78. Wisma BSG
79. Wisma Bakrie
80. Wisma Bank Dharmala
81. Wisma Bank Dwipa
82. Wisma Bank Pacific
83. Wisma Bank Tiara
84. Wisma Bhakti Mulia
85. Wisma Bonauli
86. Wisma Budi
87. Wisma Bumiputera
88. Wisma Dharmala Manulife
89. Wisma GKBI
90. Wisma Hayam Wuruk
91. Wisma Indocement
92. Wisma Kosgoro
93. Wisma Kyoei Prince
94. Wisma Mampang
95. Wisma Metropolitan I
96. Wisma Metropolitan II
97. Wisma Pondok Indah
98. Wisma Rajawali
99. Wisma Sarinah
100. Wisma Standard Chartered
101. Wisma Tugu I & II
102. World Trade Center Jakarta

APARTMENT DIRECTORY

1. Aditya Mansions
2. Apartemen Ambasador
3. Apartemen Atap Merah
4. Apartemen Brawijaya
5. Apartemen Casablanca
6. Apartemen Cilandak
7. Apartemen Citraland Regency
8. Apartemen Golf Pondok Indah
9. Apartemen Griya Prapanca
10. Apartemen Kuningan
11. Apartemen Menara Budi
12. Apartemen Menteng (Menteng Residence)
13. Apartemen Mitra Sunter
14. Apartemen Nuansa Hijau
15. Apartemen Parama (The Parkway Apartment)
16. Apartemen Permata Gandaria
17. Apartemen Permata Hijau
18. Apartemen Permata Manggala
19. Apartemen Puri Kemayoran
20. Apartemen Semanggi
21. Apartemen Setiabudi (Kuningan Apartment)
22. Apartemen Simprug Indah
23. Apartemen Slipi
24. Apartemen Taman Raja (King Gate Mansion)
25. Apartemen Tropik
26. Apartemen Wisma Indah
27. Ascott Tower
28. Beverly Tower (Menara Biduri)
29. Bonavista
30. Dukuh Golf Jakarta
31. Embassy Tower
32. Emerald Apartment
33. Grand Cempaka
34. Griya Pnacoran (Fountain Park)
35. Hilltop
36. Hilton Residence
37. ITC Roxy Mas Apartment
38. Istana Harmoni (Palace View)
39. Istana Sahid
40. Kondominium Juanda Regency
41. Kondominium Kintamani
42. Kondominium Menara Kuningan
43. Kondominium Palma Citra
44. Kondominium Rajawaly
45. Kondominium Taman Kemayoran
46. Kondominium Taman Pasadenia
47. Kota Kasablanka
48. Kusuma Candra
49. Luxury Kemang Apartment
50. Menara Gading
51. Menteng Prada
52. Menteng Regency
53. Mitra Bahari
54. Oasis Mitra Sarana
55. Pangeran Jayakarta Palace Condominium
56. Panorama Golf Kondominium
57. Pavilion Park
58. Plaza Kempinsky Jakarta
59. Pondok Club Villas I & II
60. Pondok Club Villas III
61. Prapanca Residence
62. Puri Casablanca
63. Puri Imperium
64. Puri Raya (Park Royale Executive Suites)
65. Rajawali Kondominium
66. Ratu Plaza Apartment
67. River View
68. Saphire Regency
69. Senopati Apartment
70. Simpruk Teras
71. Taman Kemayoran
72. Taman Rasuna
73. Taman Tebet (Tebet Park)
74. Vila Kemang
75. Wesling Kedoya
76. Graha Cempaka Mas

SHOPPING CENTER DIRECTORY

1. Ambasador Kuningan I
2. Arion Plaza 1 & 2
3. ITC Mangga Dua
4. Kramatjati Indah
5. Mal Blok M
6. Mal Citraland
7. Mal Kalibata
8. Mal Kelapa Gading
9. Mal Mangga Dua
10. Mal Mega
11. Mal Pondok Indah
12. Mal Puri Indah
13. Mega Pasaraya
14. Pasar Festival
15. Plaza Atrium
16. Plaza Blok M
17. Plaza Cipulir
18. Plaza Gajah Mada
19. Plaza Golden
20. Plaza Indonesia
21. Plaza Jatinegara
22. Plaza Kebayoran
23. Plaza Pondok Gede
24. Plaza Ratu
25. Plaza Senayan
26. Plaza Slipi Jaya
27. Sarinah
28. Mega ITC Cempaka Mas