

2.2.2 Presentation Materials

Handout for 2nd Workshop: November 27, 2009

<p>The Study for the Development of an Integrated Solution related to Industrial Waste Management in the Industrial Pole of Manaus. Japan International Cooperation Agency (JICA) Kojima Kogyo Co., Ltd. & EX Corporation</p> <p>2nd Workshop of the JICA/SUFRAMA Study Comfort Hotel Convention Room, November 27, 2009, 14:00-18:30</p> <p>Workshop on the Framework of Industrial Waste Management Master Plan for Industrial Pole of Manaus</p> <p>This is the second workshop for the study for the development of an integrated solution related to the industrial waste management in the Industrial Pole of Manaus. This workshop is part of the cooperation agreement signed among Manaus Free Zone Superintendence (SUFRAMA), the Brazilian Cooperation Agency of the Foreign Affairs Ministry (ABC), and the Japanese International Cooperation Agency (JICA) and it counts on the partnership of the Amazon-Orinoco Industrial Federation (FOIAM), the Amazonian State Industry Union (FEAM) and the Amazon-Orinoco Commerce Chamber of the State of Amazonas and on the support of governmental institutions linked to the environmental issue. The study aims at formulating a Master Plan (mainly proposals) for the reduction of the volume and destination of waste to be implemented from 2011 to 2013.</p> <p>This is the second in a series of workshops and is aimed to present the framework for the Master Plan based on results from the first stage of the project, discussion between the JICA Study Team and Brazilian counterparts, as well as feedback from participants in the first workshop. The second workshop will again provide participants the opportunity to discuss several aspects of the framework and give their opinion, which will then be taken into account for the finalization of the Master Plan.</p> <p>Background of the Study</p> <p>Manaus Free Zone (MZ) is an economic development level implemented by the Brazilian government to create a sustainable economic zone in the Amazon basin. At the heart of the MZ is the Manaus Industrial Pole (PIP), one of the most modern industrial parks of Latin America. The PIP includes approximately 400 national and international industrial activities in a variety of sectors (e.g. electronics, chemicals, pharmaceuticals and chemicals) and is entirely responsible for producing approximately 20% of Brazil's GDP (Gross Domestic Product).</p> <p>Increasingly, healthy development also requires a careful look at any environmental issues. Improving industrial waste management in the Manaus Free Zone and Japanese cooperation agency (JICA) and the Superintendence of the Manaus Free Zone (SUFRAMA) to sign a technical cooperation agreement to evaluate the current conditions of their industrial waste at Manaus Free Zone in the PIP. This study was published as a book, and began in February 2009. The Japanese government is providing around \$1 million USD to create the study over a 16-month period and SUFRAMA is providing the study team with logistical support. JICA selected consultants from Kojima Kogyo Co., Ltd. and EX Corporation to</p>	<p>The Study for the Development of an Integrated Solution related to Industrial Waste Management in the Industrial Pole of Manaus. Japan International Cooperation Agency (JICA) Kojima Kogyo Co., Ltd. & EX Corporation</p> <p>carry out the study, and is also working with FEAM, FOIAM and the Amazon-Orinoco Chamber of Commerce and Industry of Amazonas.</p> <p>Already, the PIM industries are engaged, according to the Recommendation N. 001/2009 of Amazonian State Public Ministry the industrial waste according to CONAMA Resolution 114. A large part of the waste they generate is removed by companies in Manaus licensed by Amazonian State environmental organizations for collection, transportation and final disposal services. Also, some hazardous waste are stored in other states if local companies do not have the adequate specialization.</p> <p>This presents a number of issues to be resolved:</p> <ul style="list-style-type: none"> Many PIM businesses need for increasing fact understanding of proper industrial waste management and do not exhibit a waste inventory. Without a sufficient waste inventory database or analysis, the composition and quantity of industrial waste coming out of the PIM remains unclear. Lack of an adequate system and insufficient capacity to control the disposal of industrial waste. <p>Overall Objectives and End Goals of the Study</p> <p>The Study for the Development of an Integrated Solution related to the Industrial Waste Management in Manaus Industrial Pole presents two main objectives. These are:</p> <ul style="list-style-type: none"> To compile a report of results having reviewed current conditions of industrial waste management in the MZ PIP and the surrounding area. To formulate a 3-year master plan (2011-2013) for industrial waste management in PIM along with guidelines for the improvement of industrial waste management in PIM. <p>In order to achieve these objectives, the following end goals are sought:</p> <ul style="list-style-type: none"> To have established appropriate industrial waste disposal and the coverage of IR (Incineration, Recovery, Recycling) based on the master plan for industrial waste management in the target study area. To have established of appropriate industrial waste disposal and the IR strategies, to have reduced illegal dumping of industrial waste and minimize environmental impact. <p>In order to grasp the actual conditions of industrial waste disposal, the team began a second step of creating a plant which clearly demonstrates the flow of waste. The key is to depict the waste flow from factory categories: (a) generation sources, which we call "flow-in" and (b) waste discharged from generation sources, which we term "flow-out".</p> <p>The inventory currently used in Brazil talks on "what, to where and how much" a factory has discharged, but does not reveal the process of off-site disposal. That is why it is necessary to grasp the</p>
<p>The Study for the Development of an Integrated Solution related to Industrial Waste Management in the Industrial Pole of Manaus. Japan International Cooperation Agency (JICA) Kojima Kogyo Co., Ltd. & EX Corporation</p> <p>conditions of waste management and clarify the on-site flow of generation sources and off-site disposal flows, while also grasping the actual conditions of waste management companies to get a clear picture of the waste flow-out flow. The JICA study team has constructed waste flow diagrams for this effort, which are available on the SUFRAMA website as well as Newsletter Vol. 3 (Enclosed).</p> <p>Development of the Master Plan for Industrial Waste Management in PIM</p> <p>The study's participant organizations and their delegates have discussed progress and issues on a regular weekly basis. However, a series of workshops and a seminar will be held to offer an opportunity for more detailed discussion on the plan in order to achieve better understanding and have the opinion of a wide range of stakeholders. Through discussions, the study members hope to gain the cooperation and understanding from experts in formulating the plan to promote disclosure of information and include environmental considerations in the plan.</p>	

Opening Presentation for 2nd Workshop (Nov 27, 2009): Workshop Objectives

<p>Session 2</p> <h2 style="text-align: center;">Workshop Objectives</h2> <p style="text-align: center;">November 27, 2009 Maria Gracilene Belota Coordinator General COGEX/SUFRAMA</p> <p style="text-align: center;">The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p style="text-align: right;">1</p>	<h3 style="text-align: center;">Background of MFZ</h3> <ul style="list-style-type: none"> <input type="checkbox"/> An economic development model to create a sustainable economic basis in the Amazon forest. <input type="checkbox"/> Healthy development of PIM/MFZ requires a careful look at any environmental impact. <p style="text-align: right;">2</p>
<h3 style="text-align: center;">Background of the Study</h3> <ol style="list-style-type: none"> 1. To look at issues surrounding PIM industrial waste management (IWM) 2. To establish appropriate IWM in PIM/MFZ <p>➤ Technical Cooperation Agreement (November 2008) between:</p> <ul style="list-style-type: none"> ● The Brazilian cooperation agency (ABC) ● The Japanese cooperation agency (JICA) ● SUFRAMA <p>Study began in February 2009</p> <p style="text-align: right;">3</p>	<h3 style="text-align: center;">Study Objectives</h3> <ul style="list-style-type: none"> <input type="checkbox"/> Identify current industrial waste management (IWM) in PIM/MFZ <input type="checkbox"/> Formulate a master plan for IWM <input type="checkbox"/> Also, guidelines for IWM improvement <p style="text-align: right;">4</p>
<h3 style="text-align: center;">Study Goals</h3> <ul style="list-style-type: none"> <input type="checkbox"/> Establish appropriate IW disposal and the 3Rs (Reduce, Reuse, Recycle) <input type="checkbox"/> Reduce risk of illegal dumping of industrial wastes and minimize adverse environmental impact <p style="text-align: right;">5</p>	<h3 style="text-align: center;">Policy for the Master Plan</h3> <ol style="list-style-type: none"> 1. Brazilian Initiative 2. Social Understanding and Cooperation 3. Environmental Consideration 4. Practicability <p>➤ To apply the policy, three workshops and one seminar are held.</p> <p style="text-align: right;">6</p>
<h3 style="text-align: center;">Workshop/Seminar Plan</h3> <p style="text-align: right;">7</p>	<h3 style="text-align: center;">Overview of First Workshop</h3> <ul style="list-style-type: none"> <input type="checkbox"/> The First Workshop was held on September 11th 2009 <ol style="list-style-type: none"> 1. Presented the findings of the study to stakeholders 2. Discussed ideas for improvement <p style="text-align: right;">8</p>

Aims of Today's Workshop

1. Present the framework of the IWM master plan to stakeholders
2. Discuss ideas for improvement

Your active participation during the workshop is highly appreciated

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Thank you

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Presentation 1 for 2nd Workshop (Nov 27, 2009): IWM in Japan

Session 3

Industrial Waste Management in Japan

November 27, 2009
Leader of JICA Study Team

For the Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus

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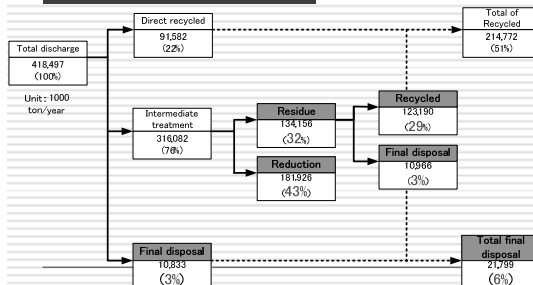
Agenda

1. Quick View of IWM in Japan
2. Bad Example of IWM in Japan
3. Current IWM Policy of Japan

2

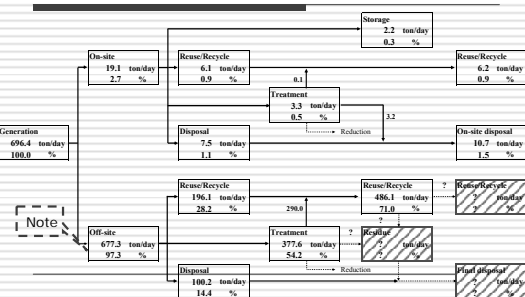
1. Quick View of IWM in Japan (1): IW Flow in 2006

- > High waste reduction rate
- > Few final disposal due to high tipping fee



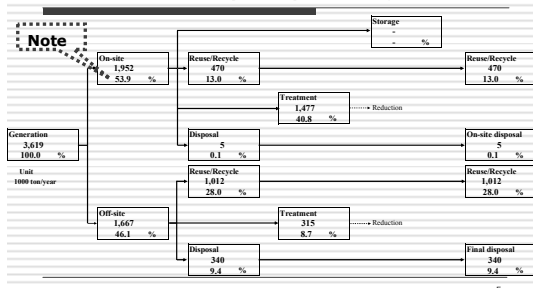
1. Quick View of IWM in Japan (2): IW Flow in PIM in 2009

- > Almost all of waste (97.3 %) are managed off-site



1. Quick View of IWM in Japan (3): IW Flow of Mie Prefecture in Japan in 2000

- > More than half of IW (53.9%) are managed on-site



1. Quick View of IWM in Japan (4): Licensing System for WMC

- Licensing is divided into 1. Business license and 2. IWM facility one.
- Business license is divided into 1. Collection & transportation and 2. Disposal (Treatment and final disposal). Each one has HIW and Non-HIW as follows:
- Number of business licenses in total in 2005 is as follows:

1. Collection & transportation for Non-HIW: 243,792
2. Collection & transportation for HIW: 24,769
3. Disposal for Non-HIW: 13,155
4. Disposal for HIW: 902

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1. Quick View of IWM in Japan (5): Number of Licensed Facilities

IW Disposal Facilities		2000	2005
1. Treatment Facilities		17,787	19,164
Sludge treatment		7,037	5,125
Incinerator	Sludge	721	679
	Waste Oil	646	639
	Waste Plastics	1,708	1,052
	Other	2,313	1,532
Total		5,388	3,902
Crushing (Wood/Rubble)		4,091	8,135
Others		1,271	2,002
2. Final Disposal Sites		2,750	2,335
HIW landfill		41	33
Non-HIW Non-inert landfill		1,035	889
Non-HIW Inert landfill		1,674	1,413
Total (1 + 2)		20,537	21,499

1. Quick View of IWM in Japan (6): Current Issues and Problems

A lack of final disposal capacity can stop industrial development and affect the living environment due to the increase of illegal dumps.

1. Quick View of IWM in Japan (7): Number of Cancelled Licenses

Number of inspections in 2005 was 161,203.







Year	Cancelled Facilities	Cancelled HIW Business License	Cancelled Non-HIW Business License
2000	81	-	-
2005	945	797	81

2. Bad Example of IWM in Japan(1): Illegal Industrial Waste Dump in Teshima Island

2. Bad Example of IWM in Japan(2): Before IW Dumping Operation (1974) Gravel mining pit

2. Bad Example of IWM in Japan(3): View of Operation When Exposed in 1990 (1)

2. Bad Example of IWM in Japan(4): View of Operation When Exposed in 1990 (2)

<p>2. Bad Example of IWM in Japan(5): Situation in 1996 (1)</p>  <p>Shredder Dust</p>  <p>View of Illegal Dump Site</p>	<p>2. Bad Example of IWM in Japan(6): Situation in 1996 (1)</p>  <p>Polluted sediments</p>  <p>Leachate from dump site</p>
<p>2. Bad Example of IWM in Japan(7): What were learned by the dispute (1)</p> <ul style="list-style-type: none"> <input type="checkbox"/> After 17 years dispute the governor of the Kagawa Prefecture finally apologized to the island residents in 2000. <input type="checkbox"/> Complete removal of the waste from the island will take over 13 years, at a public cost of about 800 million R\$. <input type="checkbox"/> Good administration save not only environment but also money. <input type="checkbox"/> One island in the national park was turned into an island of trash. <input type="checkbox"/> Mass production and consumption brings waste problems. <p style="text-align: right;">17</p>	<p>2. Bad Example of IWM in Japan(8): What were learned by the dispute (2)</p>   <p>Teshima Island</p> <ul style="list-style-type: none"> • Construction of insulating wall and leachate treatment facility • Excavation of wastes and contaminated soil • Transportation of them to Naoshima Island for treatment <p>Naoshima Island</p> <ul style="list-style-type: none"> • Construction of incineration plant • Incineration and melting of wastes and contaminated soil <p style="text-align: right;">18</p>
<p>2. Bad Example of IWM in Japan(9): What were learned by the dispute (3)</p> <ul style="list-style-type: none"> <input type="checkbox"/> If irresponsibility and disinterest come together, this kind of case, in changed form, could happen again very often. <input type="checkbox"/> Recycling based society be established instead of mass production/consumption. <input type="checkbox"/> Generator's responsibility for proper IW disposal was strengthened. <input type="checkbox"/> Extended producers responsibility from design stage. <input type="checkbox"/> Otherwise Teshima case certainly cannot be said to be special. <p style="text-align: right;">19</p>	<p>3. Current IWM Policy of Japan(1): Measures being taken for the improvement</p> <ol style="list-style-type: none"> 1. Promotion of waste minimization and reuse/recycling 2. Acquisition of trust/consent from population in locating IWM facilities 3. Strengthening of illegal dumping control measures 4. Development of a restoration system for illegal dumps <p style="text-align: right;">20</p>
<p>3. Current IWM Policy of Japan(2): Promotion of waste minimization and reuse/recycling</p> <ul style="list-style-type: none"> <input type="checkbox"/> Development of new laws and national policy for the establishment of a recycling-based society <input type="checkbox"/> Deregulation for the promotion of reuse/recycling/resource recovery <input type="checkbox"/> Expansion of market for wastes reuse/recycling and resource recovery <p style="text-align: right;">21</p>	<p>3. Current IWM Policy of Japan(3): Development of New Laws</p> <pre> graph TD A["The Basic Environmental Law (promulgated in 1993)"] --> B["The Basic Law for Establishing the Recycling-based Society (enacted in 2000)"] B --> C["Law for Promotion of Effective Utilization of Resources (enacted in 2000)"] B --> D["Waste Management and Public Cleansing Law (revised in 1997 and enacted in 2000)"] C --> E[" "] D --> E style E fill:none,stroke:none </pre>

<p>3. Current IWM Policy of Japan(4): Development of New Laws</p>	<p>3. Current IWM Policy of Japan(5): Ecotowns Project (1)</p> <p>1. What is Ecotowns?</p> <ul style="list-style-type: none"> <input type="checkbox"/> A Name of the Project of Ministry of Economy, Trade and Industry of Japan (METI). <input type="checkbox"/> In 1997, METI proposed to create new environmental towns based on the Zero Emission Concept. <p>2. Objectives of the Ecotown Project</p> <ul style="list-style-type: none"> <input type="checkbox"/> Promotion of Regional Development by developing environmentally friendly industry based on advantageous condition in each region. <input type="checkbox"/> Creation of Environmental System involving public sectors, industries and citizens in order to develop the society based on Resource Recycling <p style="text-align: right;">24</p>
<p>3. Current IWM Policy of Japan(6): Ecotowns Project (2)</p> <p>3. Who are involved?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Local Governments such as prefecture or city governments <input type="checkbox"/> Industries located in the cities or the regions <input type="checkbox"/> Citizens of the cities <p>4. To Start the Ecotown Project</p> <ul style="list-style-type: none"> <input type="checkbox"/> The Local Government prepares the Ecotown Plan through open dialogue with local industries and the citizens. <input type="checkbox"/> The Local Government submits the Plan to the METI <input type="checkbox"/> METI examines the Plan and decide to give financial support to realize the Plan <p style="text-align: right;">25</p>	<p>3. Current IWM Policy of Japan(7): Ecotowns Project (3)</p> <p>5. When the Local Government plans the Ecotown Project</p> <ul style="list-style-type: none"> <input type="checkbox"/> It is important to involve local industries and citizens <input type="checkbox"/> Because the Local Government's policy to developing the town should be in harmony with the industry's intention and the citizen's opinion <p>6. METI supports this financially in the following ways:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ecotown Software Subsidy = Subsidy for Operating Promotional Activities <input type="checkbox"/> Ecotown Hardware Subsidy = Subsidy for building the Environmental Facilities such as Recycling Plant <p style="text-align: right;">26</p>
<p>3. Current IWM Policy of Japan(8): Ecotowns Project (4)</p> <p>7. Ecotown Software Subsidy is used for:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Designing the environmental system to realize the Plan <input type="checkbox"/> Feasibility Study of Facility Plans <input type="checkbox"/> Promotion of Eco-business Marketing such as Eco-business Exhibition <input type="checkbox"/> IT Development to promote Citizen's awareness <input type="checkbox"/> Other Informational activities such as seminars <p>8. Case of Kawasaki City</p> <ul style="list-style-type: none"> <input type="checkbox"/> Population: 1.2 million <input type="checkbox"/> Location: 30 km eastward from Tokyo <input type="checkbox"/> History: Heavy and chemical industries has developed since 1950s resulting in air pollution. Kawasaki Asthma is a typical disease caused by pollution. Kawasaki City Government has paid attention to pollution control intensively <p style="text-align: right;">27</p>	<p>3. Current IWM Policy of Japan(9): Ecotowns Project (5) Birdseye view of Kawasaki city</p>
<p>3. Current IWM Policy of Japan(10): Ecotowns Project (6) Illustration of Kawasaki Ecotown</p>	<p>3. Current IWM Policy of Japan(11): Ecotowns Project (7)</p> <p>9. Programs in Ecotown Plan of Kawasaki City</p> <ul style="list-style-type: none"> <input type="checkbox"/> Promotion of Ecoconscious Industry <input type="checkbox"/> Enhancement of Ecofriendly Activities in the city area <input type="checkbox"/> Research for Sustainable Development <input type="checkbox"/> Informational Development on Ecotown <p>10. Promotion of Ecoconscious Industry</p> <ul style="list-style-type: none"> <input type="checkbox"/> Zero Emission Model Factories = System development of environmental management = Zero emission of wastewater and solid waste from the factories = Ecofriendly transportation <input type="checkbox"/> Demonstrative Facilities = Show window of the model technology <p style="text-align: right;">30</p>

3. Current IWM Policy of Japan(12): Ecotowns Project (8)

11. Enhancement of Ecofriendly Activities in the city area

- Environmental Statement of the city
- Development of Zero Emission Industrial Zone
- City Greening and Amenity Development
- Use of Clean Energy Cars
- Cooperative Activities in the Community for Recycling

12. Research for Sustainable Development

- Efficient Utilization of Energy
- Consumer Products Recycling
- Promotion of R&D Industry

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3. Current IWM Policy of Japan(13): Ecotowns Project (9)

13. Informational Development on Ecotown

- Development of Database on Environmental Technology
- Evaluation System for Environmental Performance
- Information Dissemination
- Construction of Ecotown Plaza

14. Essentials of Ecotown Plan

- Not limited only to Industry
- Collaboration of the Local Governments, Local Industries and the Citizens
- Enhancement of Recycling Activities
- Development of New Environmental Technologies

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3. Current IWM Policy of Japan(14): Ecotowns Project (10)

15. Conditions to create Ecotowns

- Local Government is capable to prepare the Ecotown Plan, considering the regional conditions, type and location of industries and citizen's awareness
- Industries are environmentally conscious and powerful enough to realize the Plan
- Citizens are aware of the environment enough to share the role

16. Society based on Resource Recycling

- System for the whole society
- Cooperation between Public sectors, Industries and Citizens
- Recycling as a marketable business

!! Ecotown Plan is a tool to create a new society based on resource recycling!!

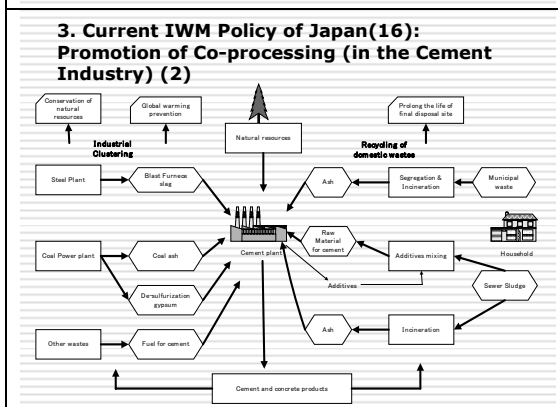
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3. Current IWM Policy of Japan(15): Promotion of Co-processing (in the Cement Industry) (1)

> Co-processing at the cement kiln has been promoted from late 1990 in Japan.

> In 2007 waste utilization rate for cement production becomes 43.5% while only 0.84% in Manaus

	2000	2004	2007	
Waste	Blast furnace slag	12,162	9,231	9,304
	Coal ashes	5,145	6,937	7,256
	By-product gypsum	2,643	2,572	2,636
	Waste oil	359	450	479
	Waste wood chips	2	305	319
	Waste plastics	102	283	408
	Waste tires	323	221	148
	Others	6,623	8,781	10,170
	Total	27,359	28,780	30,720
	Cement Product	Production	82,373	71,682
Rate (Waste/Cement)		33.2	40.1	43.5



Thank you very much for your attention

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Presentation 2 for 2nd Workshop (Nov 27, 2009): Concept of IWM Master Plan in PIM

Session 4

Concept of Industrial Waste Management Master Plan in PIM

November 27, 2009
Counterpart to JICA Study Team
For the Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus

1

Agenda

1. Objective of the Industrial Waste Management (IWM) Master Plan (M/P) in PIM
2. Current Issues of IWM in PIM
3. Proposed Measures to Solve Issues of IWM in PIM

2

1. Objective of the IWM M/P in PIM (1)

- Objective of the IWM M/P is to establish an appropriate IWM system in PIM in 2015.
- By achieving the objective, the following end goals are pursued.
 1. To establish appropriate industrial waste disposal and the 3Rs (Reduce, Reuse, Recycle) in PIM.
 2. With the establishment of appropriate industrial waste disposal and 3Rs, reduce improper disposal of IW and minimize adverse environmental impact.
- To realize the above conditions, companies both domestic and foreign will be encouraged to enter PIM and create new employment opportunities.

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1. Objective of the IWM M/P in PIM (2): Current Situation of IWM in PIM

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1. Objective of the IWM M/P in PIM (3): Improved Situation of IWM in PIM

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2. Current Issues of IWM in PIM (1)

1. Management of IW generated in PIM is unclear:
 - The study can not identify final destination of some IW, especially residues after treatment & recycling.
 - Insufficient waste manifest system (WMS) without designated forms and procedures.
 - Submission of waste inventory (WI) obligated by CONAMA Resolution 313 is not sufficient.

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2. Current Issues of IWM in PIM (2): Current IW Flow

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2. Current Issues of IWM in PIM (3): Rio WMS System

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2. Current Issues of IWM in PIM (4): Submission of WI to SUFRAMA

Item	2005	2006	2007
Number of Factories Operating in PIM			440
Questionnaires Sent* 1	186	223	229
No. of Respondents	102	94	126
Ratio of Response (%)	54.8	42.2	55.0
Did not answer	84	129	103

Note: *1: Sent to the factories in DI 1 & 2

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2. Current Issues of IWM in PIM (5)

2. Current final disposal sites, main destination of IW, do not have operation license (OL)
 - Neither Manaus City Landfill (MCL) nor Private landfill (PRL) has OL.
 - If final destination of IW in PIM is MCL or PRL, it would not satisfy ISO 14000 conditions.
 - Construction of a licensed landfill has been an issue for long time for IWM in MFZ but not realized yet.
 - Co-processing, considered as final destination because of no residues, is limited.

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2. Current Issues of IWM in PIM (6):

3. Administration Weakness for IWM

- Limited personnel responsible for IWM administration, i.e. No at Present (3 persons from 2010) in SUFRAMA, 7 persons in IPAAM
- There is an legal requirement of EL but Licensing system of WMC is not well established.
- Current status of WMC is unclear. There may be improperly managed WMCs operating in MFZ.
- WI submitted is not fully utilized for IWM.

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2. Current Issues of IWM in PIM (7):

4. Current environment of IWM business can not allow proper IWM by WMCs.

- MCL which is receiving a large amount of IW is free of charge.
- Enforcement of improper IWM is insufficient.
- Due to the above situation, competition among WMC is very hard and IW disposal price becomes low. Consequently, investment for construction of appropriate IWM facilities and operation is very limited.

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3. Proposed Measures to Solve Issues of IWM in PIM (1)

- The M/P proposes measures to be implemented by 2015

1. Identification of Clear IW Flow in PIM

Measure 1: Establishment of waste manifest system (WMS) by IPAAM => IPAAM may ask cooperation of FEEMA of Rio de Janeiro

Measure 2: Until the establishment of WMS, the Generator (G) will ask the Receptor (R) to submit a Certificate of Waste Destination (CDR) to G and G submit a report of final destination to IPAAM.

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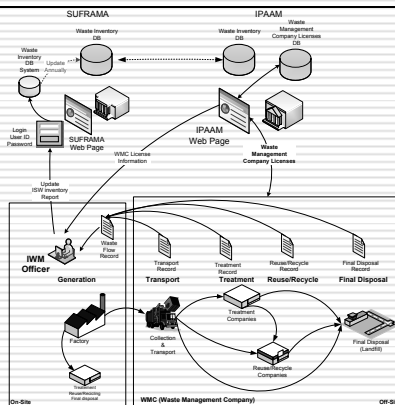
3. Proposed Measures to Solve Issues of IWM in PIM (2)

Measure 3: All factories submit waste inventories (WIs) as follows:

- Each factory shall appoint an IWM officer (IWMO) and IWMO shall submit WI to SUFRAMA.
- SUFRAMA in collaboration with JICA Team will develop a WI database with management manual including a form of WI preparation.
- In order for IWMO to understand the form and prepare WI properly SUFRAMA will provide explanation meetings of the manual and form to IWMO of PIM factory.
- Then, SUFRAMA will provide on-line input format to all factories in PIM in order for them to properly make their WI.

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3. Proposed Measures to Solve Issues of IWM in PIM (3): WI Management System



3. Proposed Measures to Solve Issues of IWM in PIM (4)

2. Secure Final Destination of IW in PIM

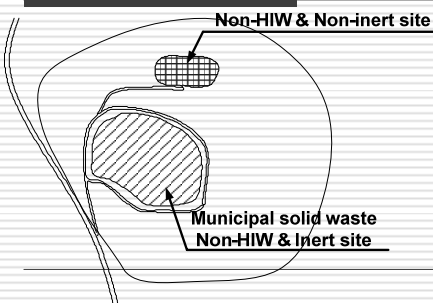
Measure 1: SUFRAMA in cooperation with FIEAM and IPAAM actively foster construction of an IW final disposal site with operation license (OL) with some benefits.

Measure 2: Until the operation of IW landfill with OL, the following measures be taken:

- Non-HIW & Non-inert temporary disposal site (ATRINI) will be constructed in the Manaus City Landfill (MCL).

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3. Proposed Measures to Solve Issues of IWM in PIM (5): Non-HIW Non-inert disposal site in MCL



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3. Proposed Measures to Solve Issues of IWM in PIM (6)

- Manaus Municipality will manage IW disposal at MCL as follows:

1. Strictly prohibit HIW disposal

2. As for disposal of Non-HIW & Non-inert tipping fee is charged by setting fee to cover all costs for ATRINI, i.e. construction, operation, etc.

3. As for Non-HIW & Inert it can be disposed of at the same site as municipal waste (MW) if it is proved. Then tipping fee of it will be set different price from Non-HIW & Inert.

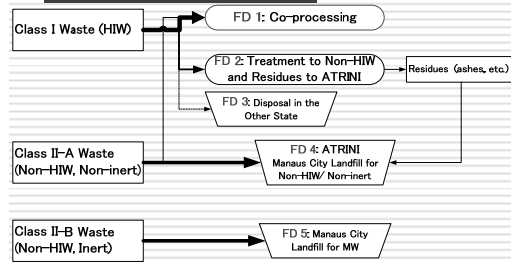
18

3. Proposed Measures to Solve Issues of IWM in PIM (7)

- For HIW the following measures will be final destination:
 1. Used as fuel and /or raw materials by **Co-processing**.
 2. HIW, which could not be co-processed, will be treated to Non-HIW by authorized treatment facilities and residues will be disposed of at ATRINI.
 3. HIW, which could not be managed by the above methods, will be disposed in an other state and /or properly stored in the factory until suitable disposal facilities can be operated in MFZ.

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3. Proposed Measures to Solve Issues of IWM in PIM (8): Proposed final destination of IW in PIM



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3. Proposed Measures to Solve Issues of IWM in PIM (9)

3. Strengthening Administrative Capacity

Measure 1: Strengthening organizations:

- SUFRAMA: Setting up a new IWM unit
- IPAAM: Assignment of necessary staff, improvement of facilities, etc.

Measure 2: Improvement of control system of WMC

- Provide a new environmental license code for WMC and it will be divided into mainly 4 categories; transportation, treatment, reuse/recycling and final disposal.

21

3. Proposed Measures to Solve Issues of IWM in PIM (10)

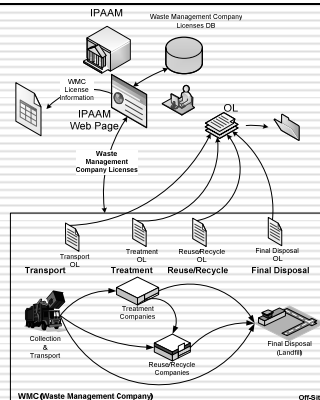
- IPAAM in collaboration with JICA Team will develop a WMC database with management manual including a form of Operation License (OL) application.
- In order for WMC to understand the licensing system and OL application form IPAAM hold meetings to explain to WMCs.
- Then, IPAAM will provide on-line input format to all WMCs in order for them to properly apply for OL application.

Measure 3: Strengthening enforcement capacity

- IPAAM shall create transparency of WMCs with OL on their web-site. So that generators will examine OL of their IW receptors. => elimination of non-license WMC
- IPAAM will concentrate on enforcement of improper IWM by licensed WMC.

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3. Proposed Measures to Solve Issues of IWM in PIM (11): Proposed EL system for WMC



Off-Site

3. Proposed Measures to Solve Issues of IWM in PIM (12)

Measure 4: Strengthening cooperation among administrative organizations concerned in IWM

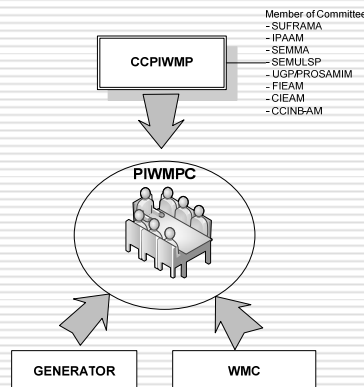
- To set up a Coordination Committee for Proper IWM Promotion (CCPIWMP) by evolution of TCSC (Technical Sub-committee) of the Study
- CCPIWMP will have monthly meeting.

Measure 5: Development of cooperation among administration, generator and WMC

- CCPIWMP will set up a Proper IWM Promotion Committee (PIWMP) to promote cooperation among administration, generator and WMC.
- CCPIWMP will organize workshops for WI and WMC databases, seminars for proper IWM technologies, legislation, etc.

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3. Proposed Measures to Solve Issues of IWM in PIM (13): Proposed CCPIWMP and PIWMP



3. Proposed Measures to Solve Issues of IWM in PIM (14)

4. Improvement of business environment for WMC

Measure 1: Introduction of final disposal fee for IW disposal at Manaus City Landfill (MCL)

- Fee shall cover all expense for proper IW disposal
- ##### Measure 2: Enforcement of laws and regulations to non-licensed WMC and improper disposal by licensed WMC

- Utilization of WMC database, information from generators and residents, etc.
- Monitoring of WMCs with license

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<p>3. Proposed Measures to Solve Issues of IWM in PIM (15)</p> <p>Measure 3: Provision of information, education and training to generator and WMC</p> <ul style="list-style-type: none"> <input type="checkbox"/> SUFRAMA/IPAAM will inform the generators that proper disposal is their responsibility and it requires bearing a certain cost. <input type="checkbox"/> IPAAM will provide WMCs data to generators and give education and training programs to WMCs of proper treatment /disposal technologies and their requirement. <p>Measure 4: Fostering good WMCs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Nomination of good WMCs <input type="checkbox"/> Provision of information of WMCs <p style="text-align: right;">27</p>	<p style="text-align: center;">Thank you very much for your attention</p> <p style="text-align: right;">28</p>
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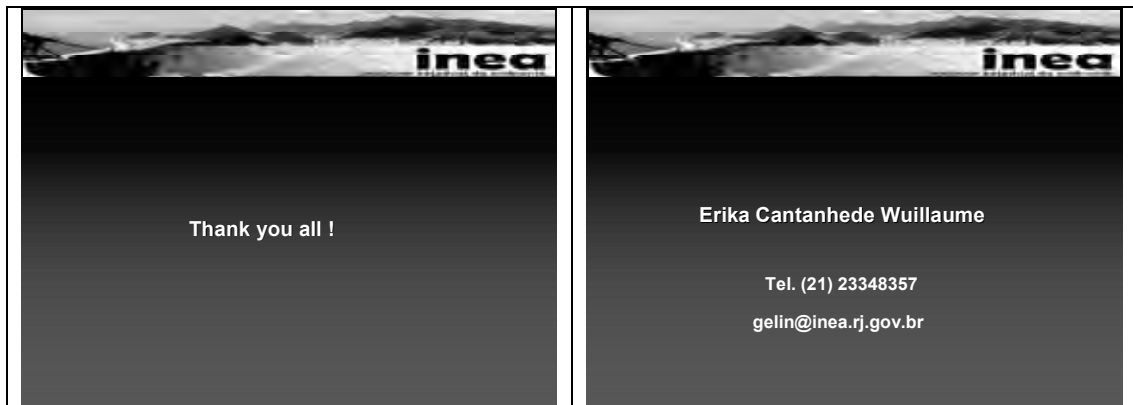
Presentation 3 for 2nd Workshop (Nov 27, 2009): IWM in Rio de Janeiro

<p>Session 5</p> <p style="text-align: center;">INDUSTRIAL WASTE MANAGEMENT IN RIO DE JANEIRO</p> <p style="text-align: center;">11/26/09</p>	<p style="text-align: center;">INEA</p> <p>✓CREATED BY THE LAW # 5.101, OF OCTOBER 4TH, 2007 AND REGULATED ON JANUARY 12THM 2009 BY THE DECREE 41.628.</p> <p>✓UNIFICATION OF THE STATE FOUNDATION OF ENGINEERING AND ENVIROMENT (FEEMA), FROM THE RIVERS AND LAKES STATE SUPERINTENDENCE (SERLA) AND FOREST STATE INSTITUTE (IEF).</p> <p>✓MISSION: PROTECT, PRESERVE AND RECUPERATE THE ENVIROMENT TO PROMOTE THE SUSTAINABLE DEVELOPMENT.</p>			
<p style="text-align: center;">ENVIROMENTAL LICENSE OBLIGATORYNESS</p> <ul style="list-style-type: none"> ✓ WASTE GENERATORS ✓ WASTE RECEIVERS ✓ TRANSPORTERS (CLASS I WASTES) 	<p style="text-align: center;">RESPONSIBILITIES, PENAL AND ADMINISTRATIVE SANCTIONS</p>			
<p style="text-align: center;">RESPONSIBILITIES</p> <table border="1" style="width: 100%;"> <tr> <td data-bbox="308 1653 547 1888"> <p style="text-align: center;">CIVIL</p> <ul style="list-style-type: none"> ✓ Obligation to repair the damages ✓ Law 7347 / 85 (Responsibility public civil action suit for damages caused to the enviroment) </td> <td data-bbox="563 1653 802 1742"> <p style="text-align: center;">ADMINISTRATIVE Administrative Sanctions (in Rio de Janeiro, Law 3467/00)</p> </td> <td data-bbox="563 1765 802 1888"> <p style="text-align: center;">PENAL Penal Sanctions Law 9.605/98 – Enviromental Crime Law</p> </td> </tr> </table>	<p style="text-align: center;">CIVIL</p> <ul style="list-style-type: none"> ✓ Obligation to repair the damages ✓ Law 7347 / 85 (Responsibility public civil action suit for damages caused to the enviroment) 	<p style="text-align: center;">ADMINISTRATIVE Administrative Sanctions (in Rio de Janeiro, Law 3467/00)</p>	<p style="text-align: center;">PENAL Penal Sanctions Law 9.605/98 – Enviromental Crime Law</p>	<p style="text-align: center;">RESPONSIBILITIES</p> <p style="text-align: center;">Article 225 Federal Constitution</p> <p>§ 3º - The conducts and activities which may be considered hazardous to the enviroment by any means will subject the transgressors, natural person or legal entities, to penal and administrative sanctions, independtly on the obligation of repairing the caused damages.</p>
<p style="text-align: center;">CIVIL</p> <ul style="list-style-type: none"> ✓ Obligation to repair the damages ✓ Law 7347 / 85 (Responsibility public civil action suit for damages caused to the enviroment) 	<p style="text-align: center;">ADMINISTRATIVE Administrative Sanctions (in Rio de Janeiro, Law 3467/00)</p>	<p style="text-align: center;">PENAL Penal Sanctions Law 9.605/98 – Enviromental Crime Law</p>		

<p style="text-align: right;">inea</p> <p style="text-align: center;">RESPONSIBILITY</p> <p>OBJECTIVE → It doesn't depend on intention or fault (negligence, incapacity or imprudence).</p> <p>SOLIDARY → The party responsible will respond to the damage even if not the direct cause</p>	<p style="text-align: right;">inea</p> <p style="text-align: center;">RESPONSIBILITY</p> <p style="text-align: center;">"FROM THE CRADLE TO THE GRAVE" (GENERATION, TRANSPORT AND DESTINATION)</p> <p>The simple generation of the waste and its non-adequate destination (even its made by third parts) is enough to generate the duty of repairing the damage.</p>
<p style="text-align: right;">inea</p> <p style="text-align: center;">ADMINISTRATIVE SANCTIONS (Law 3467/00)</p> <p>I – censure; II – simple fine; III – daily fine; ... VIII – partial or total suspension of activities; IX – interdiction of the establishment; X – restriction of rights (Cancellation of license, prohibition of contracting with the Public Administration, ...)</p>	<p style="text-align: right;">inea</p> <p style="text-align: center;">ADMINISTRATIVE SANCTIONS (Law 3467/00)</p> <p>Art. 61 § 1º V : to discharge solid, liquid or gaseous waste, or detritus, oils or oily substances, disaccording to the requirements stated in law or rules. Fine from R\$ 1.000,00 (one thousand Reais) to R\$ 50.000.000,00 (fifty millions Reais), or daily fine.</p> <p>Art. 95 – to dispose, maintain, or to have in storehouse, or to transport solid wastes disaccording to the relative regulation: Fine from R\$ 1.000,00 (one thousand Reais) to 200.000,00 (two hundred thousand Reais).</p>
<p style="text-align: right;">inea</p> <p style="text-align: center;">PENAL SANCTIONS (EXAMPLE)</p> <p>“ Art. 54. To cause any kind of pollution in levels that result or may result in damages to human health, or provoke the death of animals, or a significant destruction of the flora: ... § 2º If the crime: ... V – occurs due to discharge of solid, liquid or gaseous waste, or detritus, oils or oily substances, disaccording to the requirements stated in law or rules:</p> <p>Penalty – imprisonment, from one to five years.</p>	<p style="text-align: right;">inea</p> <p style="text-align: center;">DIVERSITY OF TREATMENT SYSTEMS OR DISPOSITION IN RIO DE JANEIRO</p> <ul style="list-style-type: none"> ✓ Recycling ✓ Compostage ✓ Incineration ✓ Blending ✓ Co-processing ✓ Rerefinement ✓ Industrial landfill - Class I ✓ Industrial landfill- Class II ✓ Segregation and temporary storage ✓ Treatment of third part flows ✓ Thermic Plasma
<p style="text-align: right;">inea</p> <p style="text-align: center;">CONTROL INSTRUMENTS</p>	<p style="text-align: right;">inea</p> <ul style="list-style-type: none"> ➤ WASTE INVENTORY ➤ WASTE MANIFEST ➤ AUTHORIZATIONS





<p style="text-align: center;">inea</p> <p style="text-align: center;">WASTE INVENTORY</p> <p>Legal Base: RESOLUTION CONAMA # 313, OCTOBER 29, 2002, which disposes about the National Inventory of Industrial Solid Wastes.</p>	<p style="text-align: center;">inea</p> <p style="text-align: center;">NATIONAL INVENTORY OF INDUSTRIAL SOLID WASTES</p> <table border="0"> <tr> <td><input type="checkbox"/> generation</td> <td><input type="checkbox"/> treatment</td> </tr> <tr> <td><input type="checkbox"/> characteristics</td> <td><input type="checkbox"/> reuse</td> </tr> <tr> <td><input type="checkbox"/> storage</td> <td><input type="checkbox"/> recycling</td> </tr> <tr> <td><input type="checkbox"/> transport</td> <td><input type="checkbox"/> recuperation</td> </tr> <tr> <td></td> <td><input type="checkbox"/> final disposal</td> </tr> </table>	<input type="checkbox"/> generation	<input type="checkbox"/> treatment	<input type="checkbox"/> characteristics	<input type="checkbox"/> reuse	<input type="checkbox"/> storage	<input type="checkbox"/> recycling	<input type="checkbox"/> transport	<input type="checkbox"/> recuperation		<input type="checkbox"/> final disposal
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<p style="text-align: center;">inea</p> <p style="text-align: center;">WASTE INVENTORY REACH</p> <div style="border: 1px solid black; padding: 5px;"> <p>✓ Refineries, chemicals, metallurgists and other industries established on Resolution CONAMA 313.</p> <p>✓ The Environment State Organization may include other industrial typologies and give priority to the biggest waste generators.</p> </div>	<p style="text-align: center;">inea</p> <p style="text-align: center;">WASTE MANIFEST</p> <p>Legal Base: DZ-1310.R-7 – WASTE MANIFEST SYSTEM</p>										
<p style="text-align: center;">inea</p> <p style="text-align: center;">WASTE MANIFEST</p> <p>Objective: To control the traffic of waste generated in Rio de Janeiro, from the origin up to its final destination.</p>	<p style="text-align: center;">inea</p> <p style="text-align: center;">SUBJECTION TO THE WASTE MANIFEST</p> <p>➤ Whichever natural person, legal, public or private entity, generators, transporters and waste receivers may be subjected to the system.</p> <p>➤ The priority of the subjection will be defined by INEA, according to the hazardousness and the quantity of waste generated by the activity.</p>										
<p style="text-align: center;">inea</p> <p style="text-align: center;">SUBJECTION TO THE WASTE MANIFEST</p> <p>➤ In case of industrial waste INEA will only subject the industrial activities which generate waste.</p> <p>➤ The system will reach every waste from any linked generator, exception to the domestic waste.</p> <p>➤ INEA may specify to certain generators the waste which should be included in the system.</p>	<p style="text-align: center;">inea</p> <p style="text-align: center;">WASTE MANIFEST</p> <p style="text-align: center;">GENERATOR RESPONSIBILITIES:</p> <ol style="list-style-type: none"> 1 To verify if both the transporter and the receiver are capable and licensed to execute the work. 2 Fill in <u>to each generated waste and to each disposal</u>, all the fields, except the ones related to the date and signature of the transporter and the receiver. 										

<p>WASTE MANIFEST</p> <p>GENERATOR'S RESPONSIBILITIES:</p> <ol style="list-style-type: none"> 3 Date and sign field 11 in all the four sheets. 4 To file the first sheet after the transporter's signature. 5 To deliver all the other sheets to the transporter. 	<p>WASTE MANIFEST</p> <p>TRANSPORTER'S RESPONSIBILITIES:</p> <ol style="list-style-type: none"> 1 Date and sign field 12 in all four sheets. 2 To file the 2nd sheet after the receiver's signature. 3 To deliver the other sheets to the receiver. 															
<p>WASTE MANIFEST</p> <p>RECEIVER'S RESPONSIBILITIES:</p> <ol style="list-style-type: none"> 1 Date and sign field 13 of the sheets delivered by the transporter. 2 To file the 3rd sheet. 3 To send the 4th sheet to the generator within 48 hours after receiving each waste. 	<p>MANIFEST FORM</p> <p>MANIFESTO DE RESÍDUOS Nº _____</p> <table border="1"> <thead> <tr> <th>RESÍDUO</th> <th>N RESÍDUO</th> <th>QUANTIDADE</th> </tr> <tr> <td colspan="2"></td> <td>Toneladas / m³</td> </tr> </thead> <tbody> <tr> <td>ESTADO FÍSICO</td> <td>ORIGEM</td> <td>Processo () ETEI () ETE () ETA () Cx Gordura () Fora do Processo () Separador de Água-Óleo () Outros, especificar</td> </tr> <tr> <td>Sólido () Semi-sólido () Líquido ()</td> <td>ACONDICIONAMENTO</td> <td>PROCEDÊNCIA</td> </tr> <tr> <td>Tambor de 200 lts. () Sacos plásticos () Industrial () Residencial () Alamo Sanitário () Reciclagem () Bombona ____ (ts) () Fardos () Restaurante () Shopping/Mercados () Alamo Industrial () Incorporação () Caçamba () Granel () Comercial () Clubes/Hotéis () Tratamento Bld./Flis-Quit. () Incineração () Tanque ____ (m³) () Big-bags () Hospital () Co-processamento () Estocagem () Outros, especificar () Outros, especificar () Outros, especificar</td> <td></td> <td></td> </tr> </tbody> </table>	RESÍDUO	N RESÍDUO	QUANTIDADE			Toneladas / m ³	ESTADO FÍSICO	ORIGEM	Processo () ETEI () ETE () ETA () Cx Gordura () Fora do Processo () Separador de Água-Óleo () Outros, especificar	Sólido () Semi-sólido () Líquido ()	ACONDICIONAMENTO	PROCEDÊNCIA	Tambor de 200 lts. () Sacos plásticos () Industrial () Residencial () Alamo Sanitário () Reciclagem () Bombona ____ (ts) () Fardos () Restaurante () Shopping/Mercados () Alamo Industrial () Incorporação () Caçamba () Granel () Comercial () Clubes/Hotéis () Tratamento Bld./Flis-Quit. () Incineração () Tanque ____ (m ³) () Big-bags () Hospital () Co-processamento () Estocagem () Outros, especificar () Outros, especificar () Outros, especificar		
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① Gerador EMPRESA / RAZÃO SOCIAL ENDEREÇO MUNICÍPIO UF TELEFONE N. LICENÇA FEEMA RESPONSÁVEL PELA EXPEDIÇÃO DO RESÍDUO CARGO					N. INVENTÁRIO DATA DA ENTREGA CARIMBO E ASSINATURA DO RESPONSÁVEL											
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<p>ACCESS TO THE ONLINE MANIFEST SYSTEM</p> <p>To have access to the Waste Manifest System the interested party has firstly to access the following page:</p> <p>http://sistemas.inea.rj.gov.br/meioambiente</p> <ul style="list-style-type: none"> ✓ To enter with login and password. ✓ The login is the CNPJ or CPF number, in case of companies represented by an individual. ✓ The password shall be requested to the INEA. 	<p>AUTHORIZATION</p> <p>Objective: To control the entrance of waste generated out of Rio de Janeiro, once in this case the manifest is not applicable.</p> <p>Rule: The receiving of waste generated out of Rio de Janeiro is conditioned to the specific allowance of INEA.</p> <p>“Exportation and Importation of Waste”</p>															




2.2.3 Outcomes

Question and Answer Session for 2nd Workshop: November 27, 2009

II WORKSHOP - QUESTIONS

1. We can see in slide 3.15 that Japan is going thru a meaningful growth in the burning of plastics and wood in the cement factories, while the quantity of tires used in that industry has decreased. What are the reasons for that? What are the other ways of recovering tires?
2. In slide 3.16 we can see the ashes of the urban wastes are co-processed. What are the management and financial and legal procedures like in Japan for the industrial and urban wastes?
3. Taking into account the 5 years time set for the implantation of the system to be adopted for the plan, what would its satisfaction degree be (in percentage) for the off-site and on-site destination of the industries of the pole in 2015? And also, how much will the industrial wastes management by SUFRAMA/IPAAM have advanced by then?
4. Is there any proposal to make the selective collection mandatory, thus decreasing the quantity of wastes going to the landfill?
5. Given the difficulty to recycle paper, is there any proposal in that sense?
6. What else could be done with the electronic components besides recycling them?
7. Once there is only control for the transportation of class I wastes, how are the class II wastes monitored, which are the ones the industries generate more? How could the solutions be applied?
8. Before so many inaccurate and/or incomplete data, how will JICA be able to set an efficient action plan?
9. Will there be any research institution such as UFAM involved to develop technologies for the use of ISW as non-conventional materials into products in MIP?
10. Forbid the use of the Municipal Landfill how would make MIP unfeasible. The proposal to charge a tipping-fee would help create alternatives without compromising MIP?
11. Congratulations Mr. Shimura for the great presentation. My doubt is: which techniques have been used to change the consciousness from a consuming society to a preserving one?
12. Do you think the Eco-City concept would ever be successful in Brazil, once the environmental awareness of the people, the position of the government and the businessmen in relation to the wastes is quite different from Japan?
13. How long did it take for Japan to make its aware the wastes must be recycled and not disposed of into the environment, thus aiming for the well-being of future generations?



14. The suggestion for the construction of an IW final disposal plant refers to incineration, recycling and landfill? How long would it take for that to be built?

15. The statement that the companies out of the State of Amazonas have not set waste treatment plants for MIP due to the free access to the landfill is not valid. What we should do is not to allow the disposal of industrial wastes in the existing landfill and verify the companies which treat those wastes have got no operational conditions for such treatment. So the companies of MIP which dispose 97% of their wastes would do something to intensively treat the wastes in a correct way according to the Law, treat those wastes in companies holding technical and operational conditions to do so according to the Law. In case we do that, there will certainly be companies out of the State of Amazonas for that kind of treatment. So your statement is not valid.

16. The figure about the background of the IWM in Japan (4th Slide of session 3) is just the same as the figure of the IWM in PIM (1st slide of session 4). Is that correct? Are the figures exactly the same?

17. What are the treatment, blending and thermal plasma systems?

18. What was proposed through JICA was a new restructuring of all the entities involved with MIP and the environment? But for me that is still not very clear.

19. Today the industries pay IPAAM a monthly fee to submit the Hazardous Industrial Wastes Manifest. Should the industry pay IPAAM or for the landfill?

20. II WORKSHOP – Questions

1. Creation of a.....
2. Solid Wastes State Policy
3. FIEAM should involve the Environment Municipal Secretariat in the proposal for the management of the industrial wastes. It is necessary to share tasks and responsibilities between the Municipality (SEMMA5) and the State (IPAAM)

Group 1, Discussion Summary for 2nd Workshop: November 27, 2009

DISCUSSIONS OF THE SECOND WORKSHOP

GROUP 1

MEDIATOR: ALEXANDRE KADOTA

Over 25 attendants.

QUESTION: Why is the co-processing of wood and plastics increasing in Japan, but the co-processing of tires is decreasing?

Answer (Mr. Shimura) – Plastics and Wood: It's because those industries have more efficient incineration processes, and new technological processes use the ash resulting from that. Tires: Today the tires are manufactured with better quality and higher durability.

COMMENT: Concerning about the Commission which will directly evaluate the Industrial Wastes Management in PIM. An attendant suggested the involvement of the Agriculture Ministry.

We realized the Industrial Wastes Management is not an attribution of the Agriculture Ministry.

COMMENT: Difficulties in recycling plastics in PIM. Large accumulation of that kind of waste.

Answer (Mr. Kadota) – There are two types of plastics:

- The soft one, which can be recycled if it is clean.

- The hard one, which requires an expensive recycling process, which became unfeasible after recent drop of the oil price.

COMMENT: The attendant from Videolar said he is worried about the land where new facilities of the company will be built, once they may not find people interested in collecting the segregated wood. According to him, the current legislation only allows that wood to be processed by companies involved with social causes.

Mr. Kadota suggested the gentleman should get in touch with the State Sustainable Development Secretariat - SDS.

COMMENT: The group declared concern about the long deadline for the implantation of the actions proposed by the study developed by JICA.

It was explained the respective deadline (2010 to 2015) is justified due to certain actions, such as the construction of a new legal landfill, which are very complex and thus require several constructions and bureaucratic processes.

Group 2, Discussion Summary for 2nd Workshop: November 27, 2009

DISCUSSIONS OF THE SECOND WORKSHOP

GROUP 2

MEDIATOR: ANTÔNIO STROSKI

Over 26 attendants.

1- QUESTION: First it was asked whether the municipal solid wastes would also be studied and if the shopping centers would be included. Then there were a few comments.

Mrs. Umaia Ismail (Planeta Verde Consultoria) – Said there are few people in Suframa involved with the environment. She suggested the survey of the information should be outsourced. She added that her very company could do that.

Mr. Fernando – Declared having followed the consulting which applied the questionnaires in the factories and said the difficulties faced and the low number of answers may have occurred due to the concern about keeping the information secret.

Mrs. Umaia – Suggested the publication of the companies which cooperated in the website, that way we would make a negative propaganda of those which insisted not to cooperate.

Mr. Juvino Rodrigues Jr. (Whirlpool Latin America) – Voiced concern about the superposition of reports. He said similar reports are already submitted to different organizations (such as SUFRAMA, IPAAM and IBAMA), and that each one has a different inventory. There should be a unification of the requested information. Some companies did not understand the intention of the questionnaires. He drew the attention for the issue of the deadlines in the companies, once the commitment to complex tasks in the factories means “begging for non-conformity”. He gave his opinion about the lecture related to INEA/RJ, saying it is better if requested documents and information are sent IT, once the archiving and control of hard copies generate bureaucracy and make the operation harder.

Mrs. Regina Tanigushi (Yamaha da Amazônia Ltda.) – Talked about the association of monetary values in relation to the treatment of the wastes the companies generate. She

suggested tax incentives should be used for the recycling companies for example. Every factory aims for profits and many of them sense recycling is a better advantage, not to mention the environmental issue.

Mr. Fúlvio Stefanelli – Commented on the digital signature (mentioning the prior statement about the signature of the hard copies). He mentioned the advances of the environmental accounting, considering everything the company pays or not as for the measures related to the environment.

Mr. Juvino – Reminded the difficulties to find licensed wastes receptors.

Mr. Carlos – Said the Workshop contributed in the sense of braking paradigms, opposing the statement of Mrs. Tanigushi. He mentioned the factories are already granted with several incentives and they need to do something about the environmental issue, not taking the financial advantages into account only, but also for the cause itself. It is necessary to raise the awareness and the 3Rs practices (reduce, reuse and recycle). He suggested the creation of a wastes exchange.

Mrs. Roseane – Reinforced the statement that the wastes manifest system of INEA/RJ, based on IT, is the ideal one. All the bureaucracy requested by IPAAM generates nothing but papers “piling-up”. IPAAM charges fees for surveillance that never take place. Besides that, in general, the fees have increased a lot recently. He asked if new fees would be charged. Suggested some kind of revision of the fee of IPAAM to the landfill.

Mrs. Umaia – Mentioned the environmental organization used to talk isolated, but they are more linked today. Suggested unified fees should be charged, with the periodicity and purposes made very clear. Commented on the necessity for reeducation on the Rs and green marketing as a way of valorizing those involved with them. Nevertheless, the first R (reduction) will only be extended when there the destination of wastes in Manus landfill is charged, once the disposal of large quantities has been very cheap (once again the issue of the environmental accounting).

Mr. Fernando – Said we should spend more time on the discussion groups and less time for the lectures, so there may be more contributions to the study.

Mrs. Francisca Felix (CETAM) – Said the awareness about the reduction of solid wastes should be raised on the basis, i.e., environmental sensitiveness starting from the most primary factory activity.

It was clarified to the group that the environmental licensing fee paid to IPAAM is not linked to what may be eventually charged for the wastes disposal in the municipal landfill.

It was also suggested that in the integrated management of the PIM wastes, materials suppliers from different processes should also be involved.

2.3 Third Workshop

2.3.1 Program

Program for 3rd Workshop: April 6, 2010

Date	Time	Venue	Moderator
April 6, 2010	8am – 5:30pm	Auditorio Floriano Pacheco, SUFRAMA	Mrs. Grazielle Belota
Session	Time	Title	Speaker
	08:00 – 08:30	Registration	
	08:30 – 08:50	Opening Address	Mrs. Flávia Grosso Superintendent of SUFRAMA Mr. Mario Inoue Representative of JICA Brazil Office
	08:50 – 09:00	Workshop objectives and procedure	Mr. Alexandre Kadota FIEAM/CIEAM/CCONB
1	09:00 – 09:20	On-site IWM in Japan	Mr. David Rocha Silva SUFRAMA
2	09:20 – 09:40	Off-site IWM in Japan	Ms. Rita Cássia Mierle SUFRAMA
3	09:40 – 10:00	IWM Administration in Japan	Mr. Armando Bandejas Júnior SUFRAMA
4	10:00 – 10:30	Master Plan	Mr. Antonio Ademir Stroski IPAAM
	10:30 – 11:00	Question and Answer Session	Each Speaker
	11:00 – 13:00	Lunch	
	13:00 – 15:00	Workshop Groups: • On-site waste management • Off-site waste management • Improvement of environmental policy for industrial waste management • Optional participant-suggested topic	
	15:00 – 15:30	Break	
	15:30 – 16:30	Group presentations (≤15 minutes each)	Group Representatives
5	16:30 – 17:00	Summary	SUFRAMA
	17:00 – 17:30	Closing remarks	SUFRAMA

Note: The Q&A session will take place after the 4 session morning presentation. Written questions will be collected from the audience by the end of each lecture.

2.3.2 Presentation Materials

Handout for 3rd Workshop: April 6, 2010

<p>The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p>Japan International Cooperation Agency Kokusai Kogyo Co., Ltd. & EX Corporation</p> <p>Tuesday, April 6, 2010 - 8:00-17:30 - SUFRAMA Auditorium</p> <p>Opinion Gathering Workshop (3):</p> <p><u>For the Draft Master Plan for Industrial Waste Management in the Industrial Pole of Manaus</u></p> <p>The Study Team is attending the 3rd workshop for "The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus." The workshop will provide opportunities to express opinions to JICA and provide feedback on proposals to formulate a preliminary version of the Master Plan for Industrial Waste Management in the Industrial Pole of Manaus to be implemented from 2011 to 2015. The proposals are based on baseline surveys from the first stage of the project, which consisted of mapping of the local industrial park, wastes flow ("waste flow"), the information collected by the JICA Study Team during the weekly meetings being held with the participants of the project, training of the representatives from the organizations which integrate the Planning and Technical Consulting Committee, offered by the Japanese government and held in Japan, and the opinion from participants of other workshops, which took place on 11 September and 27 November 2009, respectively. Please check the SUFRAMA website for more information http://www.suframa.gov.br.</p> <p>Background of the Study</p> <p>The Manaus Free Trade Zone (MTZ) is a Regional Development Policy adopted by the Brazilian government to create a sustainable economic base in the Amazon basin. At the heart of the MTZ is the Manaus Industrial Pole (PIA), one of the most modern industrial parks of Latin America. The PIA produces approximately 200 national and multinational industries working in a variety of sectors, mainly assembly production, and is responsible for creating about 500,000 jobs and directly employing 100,000 people.</p> <p>A trilateral cooperation agreement was signed between the Brazilian and Japanese cooperation agencies (JICA and ANP) and the Superintendence of the Manaus Free Trade Zone (SUFRAMA) to evaluate the current conditions of how industrial waste is handled and managed in the PIA. This study was established as a result, and began in February 2009. The Japanese government is providing around \$2 million JPY dollars to finance the study over an 18-month period and SUFRAMA is providing the study team with logistical support. JICA selected consultants from Kokusai Kogyo Co., Ltd. and EX Corporation to carry out the study, and is also working with FIEAM, CIBAM, FIEAM-AM and IPAM.</p>	<p>The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p>Japan International Cooperation Agency Kokusai Kogyo Co., Ltd. & EX Corporation</p> <p>Overall Objectives and End Goals of the Study</p> <p>The Study Team has already begun to complete its final report, having reviewed current conditions of industrial waste management in the SUFRAMA and the surrounding area. In order to achieve its stated objectives, as follows, it is necessary to work closely with related organizations and stakeholders:</p> <ul style="list-style-type: none"> To formulate a basic master plan (2011-2015) for industrial waste management in PIA along with guidelines for the improvement of industrial waste management in PIA. <p>Achieving these objectives entails the following end goals:</p> <ul style="list-style-type: none"> To have established appropriate industrial waste disposal and the concept of 3R (Reduce, Reuse, Recycle) based on the master plan for industrial waste management in the larger trade zone. With the establishment of appropriate industrial waste disposal and the 3R strategy, to have reduced illegal dumping of industrial wastes and minimize environmental impact. <p>In order to grasp the actual conditions of industrial waste disposal, the first step is creating a chart which clearly demonstrates the flow of waste. This was done by deriving the waste flow of PIA and two large enterprises (all processes covered, which we call "Process"), and (ii) waste discharged from generation sources, which we term "Off-site".</p> <p>The inventory currently used in Brazil shows "what is where and how much" a waste has discharged, but does not reveal the process of off-site disposal. For that, it is necessary to clarify the actual flow of generation sources and the site for off-site flows, while also grasping the actual conditions of waste management companies to get a clear picture of the waste off-site flow. The waste flow diagrams constructed by the JICA study team to this effect are available on the SUFRAMA website as well as Newsletter Vol. 3 in their full size (English).</p>
<p>The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p>Japan International Cooperation Agency Kokusai Kogyo Co., Ltd. & EX Corporation</p> <p>Development of the Master Plan for Industrial Waste Management in PIA</p> <p>The study's participant organizations and their delegates have discussed progress and issues on a regular, weekly basis. However, considerable options to emerge through these workshops about major industry decisions may take place, as well as a seminar which will be held in May this year to present the study results. Through these activities, the study members hope to gain the cooperation and understanding from society in formulating the master plan, to promote disclosure of information and reduce environmental considerations in the plan.</p>	<p>The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p>Japan International Cooperation Agency Kokusai Kogyo Co., Ltd. & EX Corporation</p>

Opening Presentation for 3rd Workshop (April 6, 2010): Workshop Objectives

<p>Session 3</p> <h2 style="text-align: center;"><u>Workshop (3) Objectives</u></h2> <p style="text-align: center;">April 6, 2010 Alexandre Kadota FIEAM/CIEAM/CCINB</p> <p style="text-align: center;">The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p style="text-align: right;">1</p>	<h2 style="text-align: center;"><u>Background of MFZ</u></h2> <ul style="list-style-type: none"> <input type="checkbox"/> An economic development model to create a sustainable economic basis in the Amazon forest. <input type="checkbox"/> Healthy development of PIM/MFZ requires a careful look at any environmental impact. <p style="text-align: right;">2</p>
<h2 style="text-align: center;"><u>Background of the Study</u></h2> <ol style="list-style-type: none"> 1. To look at issues surrounding PIM industrial waste management (IWM) 2. To establish appropriate IWM in PIM/MFZ <p>➤ Technical Cooperation Agreement (November 2008) between:</p> <ul style="list-style-type: none"> ● The Brazilian cooperation agency (ABC) ● The Japanese cooperation agency (JICA) ● SUFRAMA <p>Study began in February 2009</p> <p style="text-align: right;">3</p>	<h2 style="text-align: center;"><u>Study Objectives</u></h2> <ul style="list-style-type: none"> <input type="checkbox"/> Identify current industrial waste management (IWM) in PIM/MFZ <input type="checkbox"/> Formulate a master plan for IWM <input type="checkbox"/> Also, guidelines for IWM improvement <p style="text-align: right;">4</p>
<h2 style="text-align: center;"><u>Study Goals</u></h2> <ul style="list-style-type: none"> <input type="checkbox"/> Establish appropriate IW disposal and the 3Rs (Reduce, Reuse, Recycle) <input type="checkbox"/> Reduce risk of illegal dumping of industrial wastes and minimize adverse environmental impact <p style="text-align: right;">5</p>	<h2 style="text-align: center;"><u>Policy for the Master Plan</u></h2> <ol style="list-style-type: none"> 1. Brazilian Initiative 2. Social Understanding and Cooperation 3. Environmental Consideration 4. Practicability <p>➤ To apply the policy, three workshops and one seminar are held.</p> <p style="text-align: right;">6</p>
<h2 style="text-align: center;"><u>Workshop/Seminar Plan</u></h2> <pre> graph TD A["Mar 2009 - Aug 2009: Baseline Surveys on Waste Generation Sources and Waste Management Companies, etc."] --> B["Sept 2009: Current IWM and Issues"] B --> C["Nov 2009: Framework of IWM M/P"] C --> D["March 2010: Draft Final IWM M/P"] D --> E["May 2010: Presentation of IWM M/P"] B <--> W1["1st Workshop"] C <--> W2["2nd Workshop"] D <--> W3["3rd Workshop"] E <--> S["Seminar"] B --> RM1["Review & Modify"] C --> RM2["Review & Modify"] D --> RM3["Review & Modify"] E --> RM4["Review & Modify"] W1 --> EC1["EXPLANATION COMMENTS"] W2 --> EC2["EXPLANATION COMMENTS"] W3 --> EC3["EXPLANATION COMMENTS"] S --> EC4["EXPLANATION COMMENTS"] EC1 --> B EC2 --> C EC3 --> D EC4 --> E </pre>	<h2 style="text-align: center;"><u>Overview of First Workshop</u></h2> <ul style="list-style-type: none"> <input type="checkbox"/> The First Workshop was held on September 11th 2009 <ol style="list-style-type: none"> 1. Presented the findings of the study to stakeholders 2. Discussed ideas for improvement <p style="text-align: right;">8</p>

<p>Overview of Second Workshop</p> <p>□ The Second Workshop was held on November 27, 2009</p> <ol style="list-style-type: none"> 1. Present the framework of the IWM master plan to stakeholders 2. Discussed ideas for improvement <p style="text-align: right;">9</p>	<p>Aims of Today's Workshop</p> <ol style="list-style-type: none"> 1. Consensus on the formulation of the Master Plan 2. Discuss ideas for improvement <p><i>Your active participation during the workshop is highly appreciated</i></p> <p style="text-align: right;">10</p>
<p>Thank you</p> <p>□ Contact the JICA Study Team:</p> <p>E-mail: susumu_shimura@kkc.co.jp</p> <p>Tel: 3321-7281 / 3321-7280</p> <p style="text-align: right;">11</p>	

Presentation 1 for 3rd Workshop (April 6, 2010): On-site IWM in Japan

<p>Session 1</p> <p>Lecture 1: On-site (at Factory) IWM in Japan INDUSTRIAL WASTE MANAGEMENT IN THE MANAUS INDUSTRIAL POLE</p> <p>APRIL 6, 2010</p> <p>Ministério do Desenvolvimento, Indústria e Comércio Exterior BRASIL GOVERNO FEDERAL</p>	<p>Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus</p> <p>Start of the studies: February / 2009</p> <p>Technical cooperation agreement : ABC, SUFRAMA, JICA</p> <p>Partnerships : CIEAM, FIEAM, CCINB/AM</p>
<p>OBJECTIVES OF THE STUDY</p> <ol style="list-style-type: none"> 1- To review the current conditions of the Industrial Waste Management in PIM and compile the results in report form. 2- Formulating a Master Plan, with proposals for solutions to the use and disposal of waste to be implemented in the period 2011 to 2015. 	<p>TRAINING ABROAD</p> <p>LOCAL: Japan</p> <p>PERIOD : 25-1-2010~10-2-2010</p> <p>PARTICIPANTS:</p> <p>- SUFRAMA CGLOG David Rocha Silva COGEX Armando Bandeira dos Santos Jr. CGORF Rita de Cássia de V. Dias Maré</p> <p>- IPAAM Antônio Ademir Stroski</p> <p>- FIEAM / CIEAM / CCINB/AM Alexandre Kadota</p>

OBJETIVES OF THE TRAINING

- 1.To understand IWM (industrial waste management) in Japan regarding on-site (at factory), off-site (outside factory) and administration.
- 2.To formulate proposals for the Master Plan on the management of industrial waste based on the IWM in Japan.

Lecture 1: On-site (at Factory) IWM in Japan

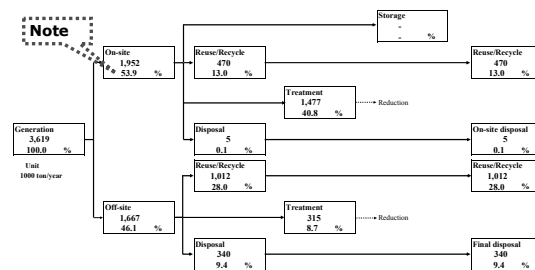
ACTIONS TO BE DEVELOPED FOR BUSINESS GENERATING WASTE

The 3R Policy (Reduce, Reuse and Recycle),
the first 2 actions (reduce and reuse) occur mainly within the factories.

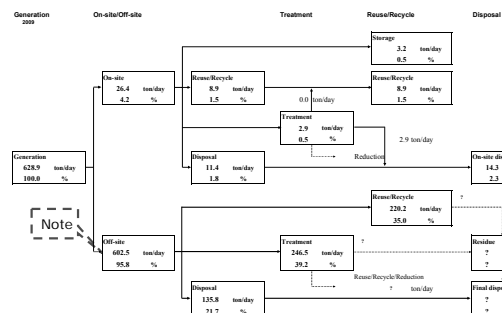
1. Current On-site IWM in Japan
2. On-site IWM in Kokubo Industrial Park
3. On-site IWM in Suzuka Seisakusyo (Factory) of Honda Co. Ltd.

- Many factories aim at “Zero Emission” from factory due to the following reasons:
 1. Off-site disposal cost is extremely expensive, especially landfill disposal fee; => Reduce, reuse and recycle waste in the factory as much as possible.
 2. Government set up a waste management policy, “Recycling-based Society”, by the Basic Law for Establishing the Recycling-based Society (enacted in 2000); and
 3. Recently, the consumer supports a company considered as environmentally friendly.

1. IW Flow of Mie Prefecture in Japan in 2000 More than half of IW (53.9%) are managed on-site



1. IW Flow in PIM in 2009 Almost all of waste (95.8 %) are managed off-site

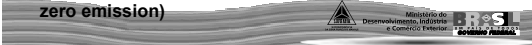
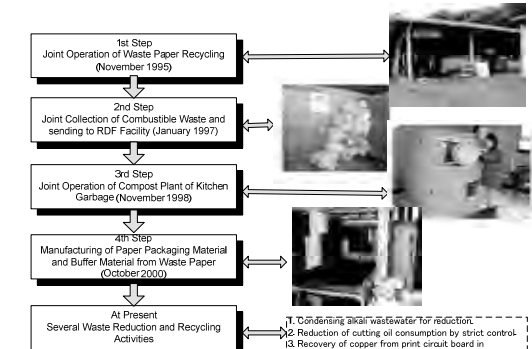
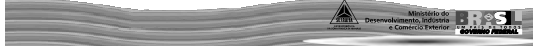
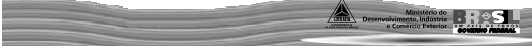
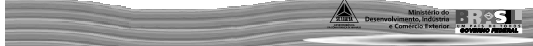
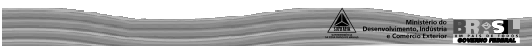

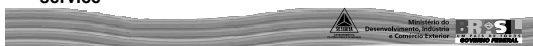


2. On-site IWM in Kokubo Industrial Park

- 1 - Models of On-Site Management
 - 1.1 - Kokubo Industrial Park - Yamanashi
- 2 - Challenges Faced
- 3 - Main Ideas
 - 3.1 - Manual of Procedures
 - 3.2 - Applying the 3Rs - Reduction
 - 3.3 - Applying the 3Rs - Reuse
 - 3.4 - Separation of waste
 - 3.5 - Pre-processing
 - 3.6 - Appropriate Storage
- 4 - Implementation of the Zero Emission

1- MODEL OF ON-SITE MANAGEMENT

- 1 - 1.1 - Kokubo Industrial Park - Yamanashi Prefecture
 - 29 / 01 / 2010 - Visit to Yokogawa - factory sensors
 - 28 companies from various areas
 - Policy of sustainability together
 - The Park generate 19 different types of waste
 - Recycling and incineration together

<p style="text-align: center;">2- CHALLENGES FACING</p> <p>2.1 – Carry the waste generated in the park to another municipalities to treatment</p> <p>2.2 - Establishment of the Committee for Research on Treatment of Industrial Waste</p> <p>2.3 - Establishment of common rules inside of Industrial Park</p> <p>2.3 - Application of new technologies for waste treatment</p> <p>2.4 - Establish a joint policy of sustainability - reuse and recycling within the industrial park (the concept of zero emission)</p> 	<p>2. Approach for Zero-emission (3R in Industrial Park) (1)</p> <p>1st Step Joint Operation of Waste Paper Recycling (November 1995)</p> <p>2nd Step Joint Collection of Combustible Waste and sending to RDF Facility (January 1997)</p> <p>3rd Step Joint Operation of Compost Plant of Kitchen Garbage (November 1998)</p> <p>4th Step Manufacturing of Paper Packaging Material and Buffer Material from Waste Paper (October 2000)</p> <p>At Present Several Waste Reduction and Recycling Activities</p>
<p>2. Approach for Zero-emission (3R in Industrial Park) (2)</p>  <p>1st Step Joint Operation of Waste Paper Recycling (November 1995)</p> <p>2nd Step Joint Collection of Combustible Waste and sending to RDF Facility (January 1997)</p> <p>3rd Step Joint Operation of Compost Plant of Kitchen Garbage (November 1998)</p> <p>4th Step Manufacturing of Paper Packaging Material and Buffer Material from Waste Paper (October 2000)</p> <p>At Present Several Waste Reduction and Recycling Activities</p>	<p style="text-align: center;">3- MAIN IDEAS</p> <p>3.1- PREPARATION OF MANUAL OF PROCEDURES FOR TREATMENT OF DOMESTIC WASTE</p> <p>- Each company is responsible for implementing the 3Rs.</p> <p>- It is prepared a handbook for internal procedures to treatment of waste (reduction, separation, separation, etc.).</p> 
<p>3.2- REDUCING THE GENERATION OF WASTE</p> <ul style="list-style-type: none"> Reduced waste of raw material (Improvement methods of production) Reduction of waste of the logistics area (sending material via container) 	<p>3.3- REUSE OF WASTE</p> <ul style="list-style-type: none"> Reducing the use of paper The use of alternative methods of internal communication; Using both sides of the sheet Using recycled paper 
<p>3.4 – SAPARATION OF THE WASTES</p> <p>To make possible the process of recycling all waste must be carefully separated from each category</p> <p>KEY BENEFITS</p> <ul style="list-style-type: none"> Decreases the exploitation of natural resources Reduces energy Enables the recycling of materials that would go to waste Reduces the cost of production, with the use of recyclable industries Reduces waste 	<p>3.4 – SAPARATION OF THE WASTES</p> <ul style="list-style-type: none"> Blue - Paper / Cardboard Yellow - Metal Green - Glass Red - Plastic Brown - Organic Orange - Hazardous waste Black - Wood Gray - general non-recyclable wastes or mixed, contaminated or not capable of separation Purple - Radioactive wastes White - Waste and health service  

3.5 – PARTIAL TREATMENT

PRE-PROCESSING

⇒ COMPRESSION OF THE WASTES (for easy storage and collection).

- Cans
- Scobs from cutting metal pieces



⇒ CUT

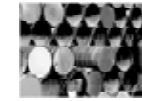
- Paper
- Cardboard
- Plastic



3.6 – SUITABLE STORAGE FOR PROMOTING THE SELECTIVE COLLECTION

Store each type of waste in special containers and at appropriate place

Facilitates the collection and processing (recycling / incineration) to Service Factories



6. POLICY OF ZERO-EMISSION

The elements necessary to implement a zero-emission project are:

Commitment

- Ecological awareness
- Selection of effective waste
- Encouraging the consumption of recycled products

Technology

- Application of methods of recycling and waste recovery

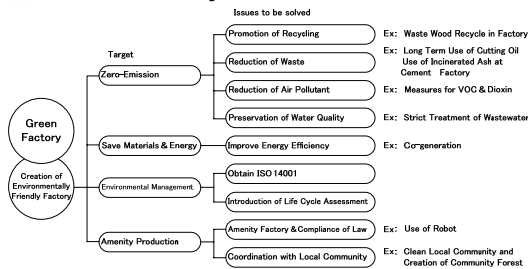
Systematization

- Compliance with the requirements set by the 14,001

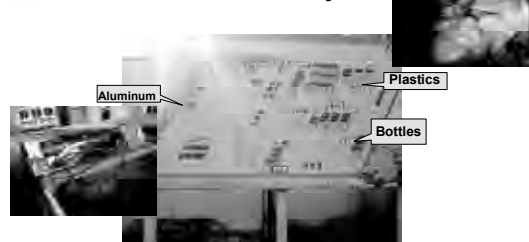
3. On-site IWM in Suzuka Factory of Honda Co. Ltd.

- Honda Suzuka Factory is one of the Factories that achieved the Zero-emission.
- The Zero-emission is one of target of the “Green Factory Plan” presented in the next screen.
- A Zero-emission team was created in the the “Green Factory Project” in 1997.
- The Zero-emission is defined as “No IWM for final disposal shall be discharged outside the factory”
- In 1999 Honda Suzuka Factory became the first zero-emission automobile manufacturing company in Japan.

3. Green Factory Plan



3. Condition of the Factory

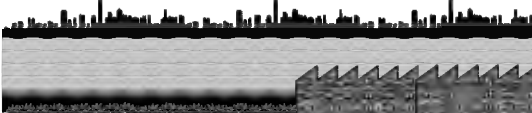


THANK YOU!

Presentation 2 for 3rd Workshop (April 6, 2010): Off-site IWM in Japan

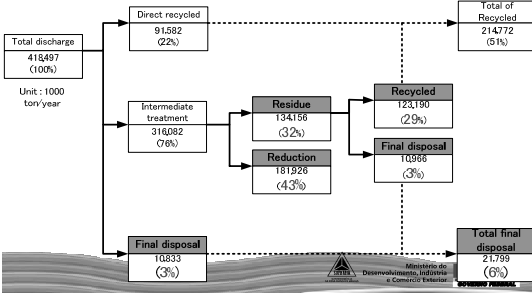
Session 2

April 6, 2010



Ministério do Desenvolvimento, Indústria e Comércio Exterior
BR/S GOVERNO FEDERAL

1. Current Off-site IWM in Japan
2. Treatment Facilities
3. Recycling Facilities
4. Co-processing Facilities
5. Blending Facilities
6. Landfilling Facilities
7. Overall IWM Center



Unit: 1000 ton/year

Total discharge: 418,497 (100%)

Direct recycled: 9,158 (2%)

Intermediate treatment: 316,082 (76%)

Final disposal: 10,833 (3%)

Residue: 134,156 (32%)

Reduction: 181,926 (43%)

Recycled: 128,190 (29%)

Final disposal: 11,055 (3%)

Total of Recycled: 214,372 (51%)

Total final disposal: 21,799 (5%)

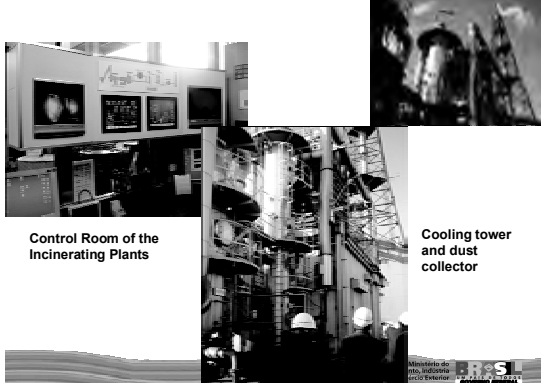
- Number of business licenses in total in 2005 is as follows:

1. Collection & transportation for Non-HIW:	243,792
2. Collection & transportation for HIW:	24,769
3. Treatment & Disposal for Non-HIW:	13,155
4. Treatment & Disposal for HIW:	902

IW Disposal Facilities	2000	2005	
1. Treatment Facilities	17,787	19,164	
Sludge treatment	7,037	5,125	
Incinerator	Sludge	721	679
	Waste Oil	646	639
	Waste Plastics	1,708	1,052
	Other	2,313	1,532
Total	5,388	3,902	
Crushing (Wood/Rubble)	4,091	8,135	
Others	1,271	2,002	
2. Final Disposal Sites	2,750	2,335	
HIW landfill	41	33	
Non-HIW Non-inert landfill	1,035	889	
Non-HIW Inert landfill	1,674	1,413	
Total (1 + 2)	20,537	21,499	


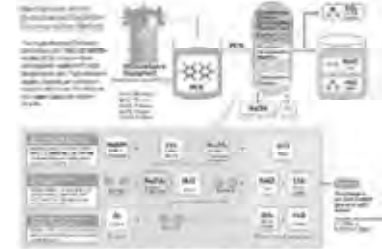



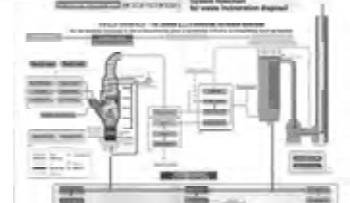








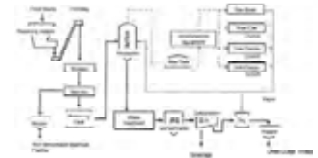

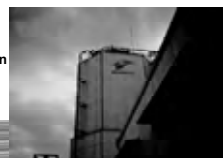
- **Treatment: 4 Facilities**
- **Recycling: 4 Facilities**
- **Co-processing: 3 Facilities**
- **Blending for Cement Factory: 3 Facilities**
- **Landfill (Final Disposal Site): 3 Facilities**
- **Overall IWM Center: 1 Facility**


















- **Target wastes:** Various types of liquid wastes such as waste oils, various types of sludge, CFC (chlorofluorocarbons), etc.
- **Treatment of emission gas:** Cooling tower, bag filter, acid gas treatment (recycle to H₂SO₄), etc.




Control Room of the Incinerating Plants


Cooling tower and dust collector

<ul style="list-style-type: none"> • Target wastes: PCB (polychlorinated biphenyl) • Treatment of method: Hydrothermal oxidation decomposition method • Five similar plants in Japan 	 <p>Reception Room for PCB Container</p>  <p>Dismantling Room for PCB Container</p> 
<ul style="list-style-type: none"> • Target wastes: Infectious and hazardous health wastes, other IW • Treatment of method: Vertical incinerator • Simple structure which decreases the need for space and the maintenance costs • Vertical combustion system in which the drying, burning and after-burning zones are vertically aligned. 	 <p>Containers for Health Waste</p>  <p>Treatment Flow Diagram</p> <p>Incineration Plant</p> 
<ul style="list-style-type: none"> • Target wastes: Municipal wastes • Treatment of method: Shaft-type incinerator with ash melting function (same as smelting furnace for iron) • Residue: Incineration ash (15% of waste) is reduced to 3%. • Facility was constructed and operating by PFI (Private Finance Initiative). • User (4 cities) pays tipping fee about 300US\$/ton. 	 <p>Melting ash extraction</p>  <p>Operation Room</p>  
<ul style="list-style-type: none"> • Target wastes: Food waste • Capacity: Solid waste 110 ton/day Liquid waste 20 ton/day • Power generation: 24,000kwh/day by methane gas generated by anaerobic decomposition of food waste 	 <p>Power Generation Unit</p>  <p>Treatment Flow Diagram</p> <p>Fermentation Tank</p> 

<ul style="list-style-type: none"> • Target wastes: Construction waste • Capacity: 960 ton/day • Mixed construction waste recycling: Average in Japan 36%. The plant aims to raise it up to 94%. • Recycle Peer Corporation is subsidized and recycles mixed construction and demolition wastes. 	<table border="0"> <tr> <td>Rate of recycling</td> <td></td> </tr> <tr> <td>Asphalt</td> <td>99%</td> </tr> <tr> <td>Concrete</td> <td>98%</td> </tr> <tr> <td>Scrap wood</td> <td>68%</td> </tr> <tr> <td>Sludge</td> <td>75%</td> </tr> <tr> <td>Average</td> <td>85%</td> </tr> <tr> <td>Mixed waste</td> <td>36%</td> </tr> </table> <p>Mechanical selection by roller screen</p>  <p>Treatment Flow Diagram</p>  <p>Vibration sieve</p> 	Rate of recycling		Asphalt	99%	Concrete	98%	Scrap wood	68%	Sludge	75%	Average	85%	Mixed waste	36%
Rate of recycling															
Asphalt	99%														
Concrete	98%														
Scrap wood	68%														
Sludge	75%														
Average	85%														
Mixed waste	36%														
<ul style="list-style-type: none"> • Target wastes: Discarded office automation equipment, print circuit board, etc. • Re-tem Corporation conducts the following services related to wastes: <ol style="list-style-type: none"> 1. Consulting; 2. Transfer of Environmental Technology; 3. Business Setting; and 4. R & D. 	 <p>Treatment Flow Diagram</p> <p>Reception of wastes</p>  <p>Sorting line</p> 														
<ul style="list-style-type: none"> • Target wastes: Waste solvents • Distill the waste solvents and produce recovered solvents • Residues are incinerated and produce hot water  <p>Distilling Tank</p>  <p>View of site visit</p> 	<ul style="list-style-type: none"> • Target wastes: Ash from incinerator, inorganic sludge, dust, etc. • Wastes are calcined in the rotary kiln by high temperature and made as artificial sand for several construction works 														
 <p>Treatment Flow Diagram</p> <p>Rotary kiln calcinator</p>  <p>Artificial sand for construction</p>  	<ul style="list-style-type: none"> • Target wastes: Combustible wastes such as plastics, papers, organic sludge, etc. • Wastes are incinerated and melted in high temperature, 2000 °C, converted into molten metals and slugs. • The plant is considered as a final destination of wastes in the waste manifest system in the State. 														

Molten metals and slugs



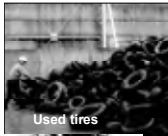


Treatment Flow Diagram


- The cement industry in Japan has been recycling an expressive quantity of several wastes, from different materials, coming from several industries. Table of next screen shows the amount of wastes and by-products co-processed in the industry.
- The industry utilized approximately 31 million tons of wastes in 2007, which is equivalent to 43.5 % of the amount of cement products (less than 1% in Manaus).
- The company was found in 1932, and the plant started operating in 1970.
- It realized 15 years ago that wastes management was a good business.

		43.5%	0.84%		
		2000	2004	2007	
Waste	Blast furnace slag	12,162	9,231	9,304	
	Coal ashes	5,145	6,937	7,256	
	By-product gypsum	2,643	2,572	2,636	
	Waste oil	359	450	479	
	Waste wood chips	2	305	319	
	Waste plastics	102	283	408	
	Waste tires	323	221	148	
	Others	6,623	8,781	10,170	
	Total	27,359	28,780	30,720	
Cement Product	Production	82,373	71,682	70,600	
	Rate (Waste/Cement)	33.2	40.1	43.5	


Manufacturing of cement using alternative raw-materials and fuels.




Used tires




Plastics



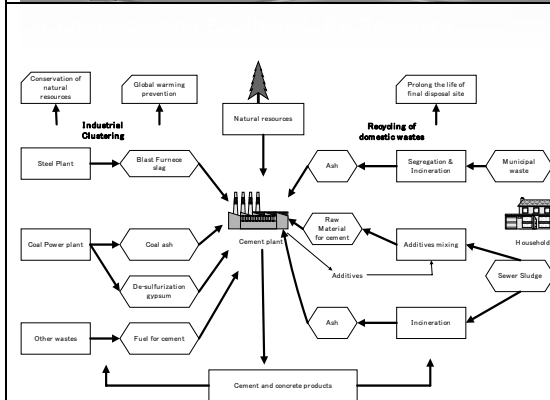
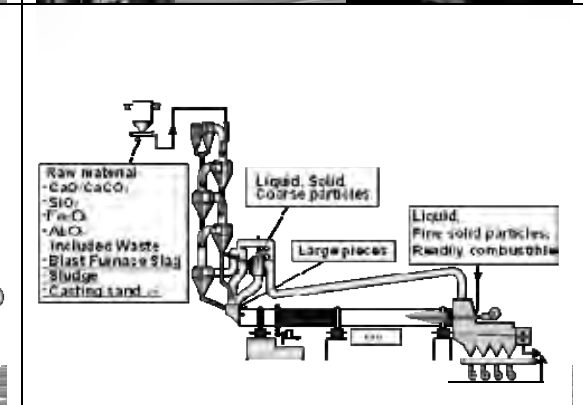
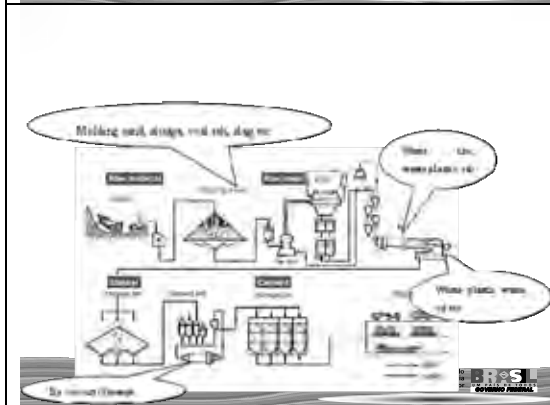
Tatames



Feeding facility for used tires



Cement kiln



- The next screen illustrates the relationship of the cement plant and the blenders of the wastes.
- Characteristics of each waste and sources are different so, in order to accept many kinds and sources of wastes, it is necessary to mix and regulate the constituents and convert them to be acceptable for the cement plant.
- These blenders of wastes are taking active roles in the waste management business.

<ul style="list-style-type: none"> The following three landfills were visited during the training: <ol style="list-style-type: none"> Yorii (Saitama Prefecture) Iga (Mie Prefecture) Kimitsu (Chiba Prefecture) 	<p>6. Landfilling Facilities (2): Kimitsu Environment Preservation Center (Before operation)</p>
<ul style="list-style-type: none"> Reduce leachate generation by construction of rain water drainage system Amount of leachate for the collection and treatment should be minimized. 	<p>Treatment of the leachate is the following 4 steps:</p> <ol style="list-style-type: none"> Biological (BOD, etc) Sand filtering (SS, etc.) Active charcoal filtering (COD, etc.) Chemical/chelating adsorption (heavy metals, etc.)
<p>Lining system</p> <ol style="list-style-type: none"> Light blocking nonwoven fabric mat Synthetic liner Nonwoven fabric mat Leachate detection mat Synthetic liner Self-repairing sheet Nonwoven fabric mat Clay layer 	<p>Operation of the landfill, 0.5m of soil for each 2m of wastes</p>