



GREEN BUILDING POLICY AND PROJECT IN INDONESIA

By Harris
Directorate General of New Renewable Energy
and Energy Conservation
Ministry of Energy and Mineral Resources

41th Meeting of the APEC Expert Group on Energy Efficiency
and Conservation (EGEE&C 41)
Beijing-China, 11-12 April 2013





Outline:

- Background
- EE&C Policy
- Green Building Development

BACKGROUND

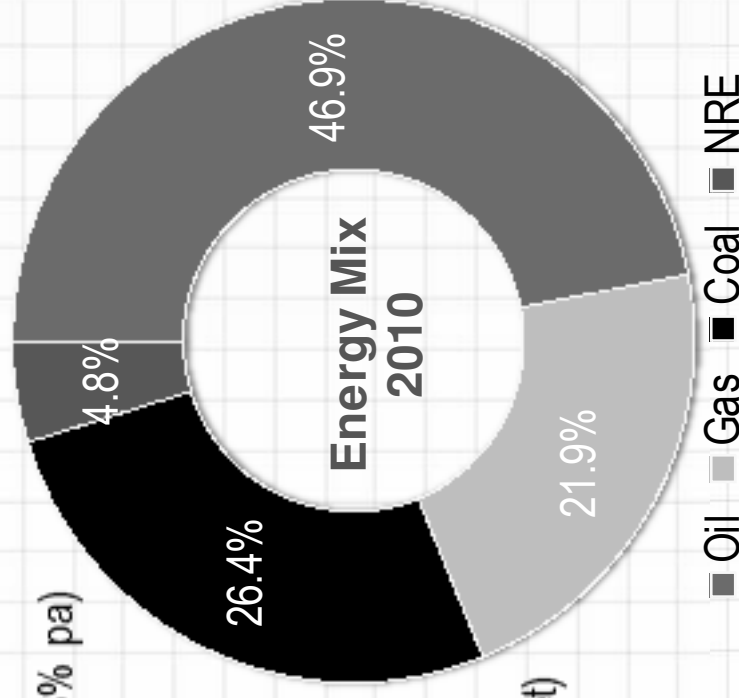




BACKGROUND

Fact

- High growth energy consumption 7% pa (GDP 5%-6% pa)
- High dependency on Fossil Energy (> 95%)
 - Oil 47%
- Low Renewable Energy use (< 5%)
- Low access to modern energy (Elect. ratio 73%)
- Low energy efficiency, high energy intensity
 - Energy elasticity 1,6 (Japan < 1)
- Large subsidy for fossil energy (20% national budget)
 - Unproductive use



Impact

- Depletion of natural resources
- Energy security at risk
- High CO₂ emission, global warming and climate change



ENERGY RESERVES AND PRODUCTION

NO	NON FOSSILENERGY	RESOURCES (RS)	INSTALLED CAPACITY (IC)	RATIO IC/RS (%)
1	Hydro	75,670 MW	5,705.29 MW	7.54
2	Geothermal	28,543 MW	1,189 MW	4.17
3	Mini/Micro Hydro	769.69 MW	217.89 MW	28.31
4	Biomass	49,810 MW	1,618.40 MW	3.25
5	Solar Energy	4.80 kWh/m ² /day	13.5 MW	-
6	Wind Energy	3 – 6 m/s	1.87 MW	-
7	Uranium	3,000 MW (e.g. 24,112 ton) for 11 years*)	30 MW	1.00

*) only in Kalan – West Kalimantan

NO	FOSSILENERGY	RESOURCES (SD)	RESERVES (CAD)	RATIO SD/CAD (%)	PRODUCTION (PROD)	RASIO CAD/PROD (YEAR*)
1	Oil (billion barrel)	56.6	7.99 **)	14	0.346	23
2	Gas (TSCF)	334.5	159.64	51	2.9	55
3	Coal (billion ton)	104.8	20.98	18	0.254	83
4	Coal Bed Methane/CBM (TSCF)	453	-	-	-	-

*) with assumption there is no new found; **) Cepu Block is included



POTENTIAL OF ENERGY CONSERVATION

Sector	Potential of EC	Target of EC Sectoral(2025)	Share of Final Energy Consump. (2009)	Total Target of EC (2025)
Industry	10 – 30%	17%	41%	6,9%
Commercial	10 – 30%	15%	5%	0,7%
Transportation	15 – 35%	20%	37%	7,4%
Household	15 – 30%	15%	13%	2%
Others (ACM)	25%	-	4%	-
Total			100%	17%



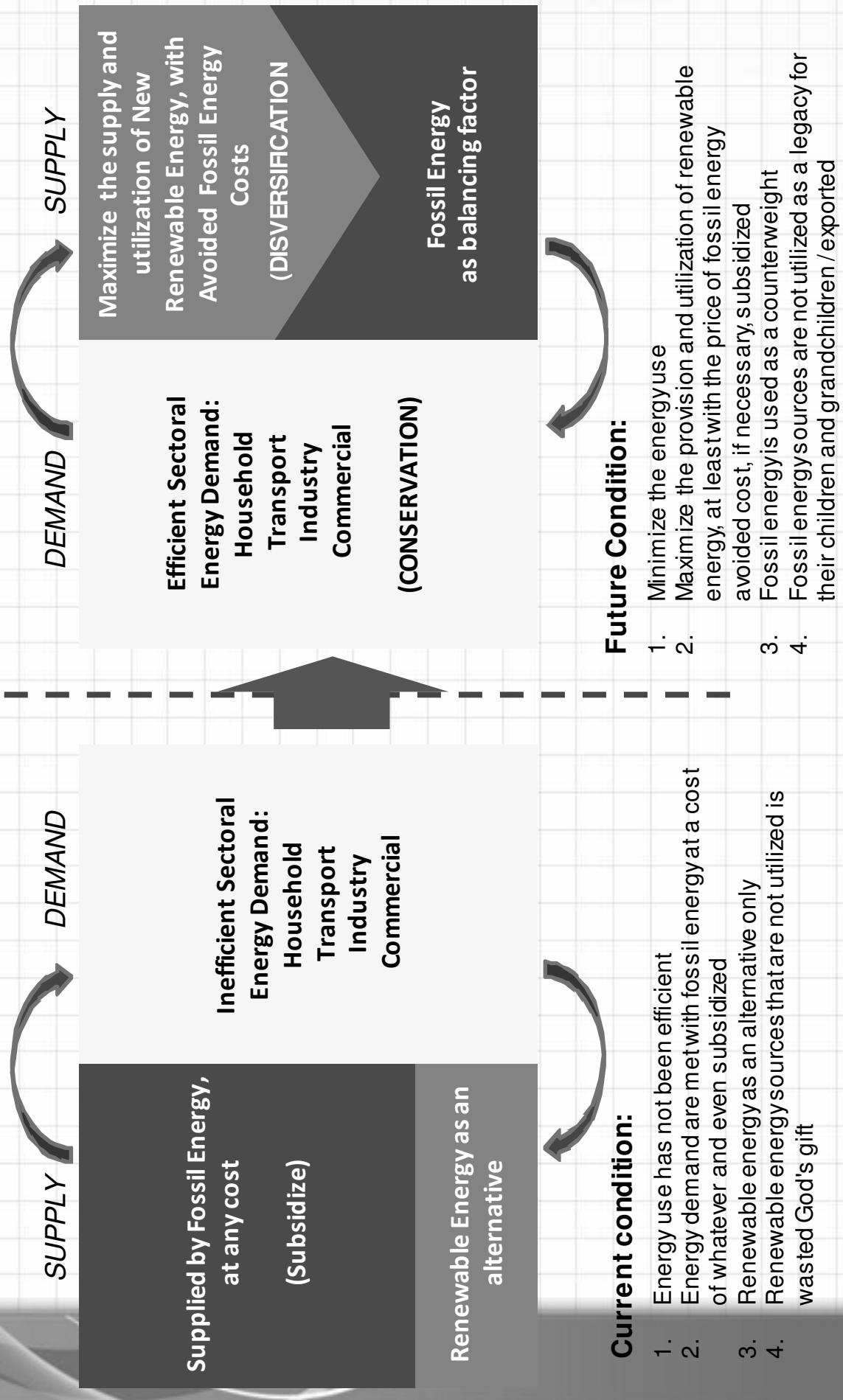
EE&C POLICY



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TRANSFORMATION PARADIGM OF NATIONAL ENERGY MANAGEMENT TRANSFORMATION PARADIGM OF NATIONAL ENERGY MANAGEMENT

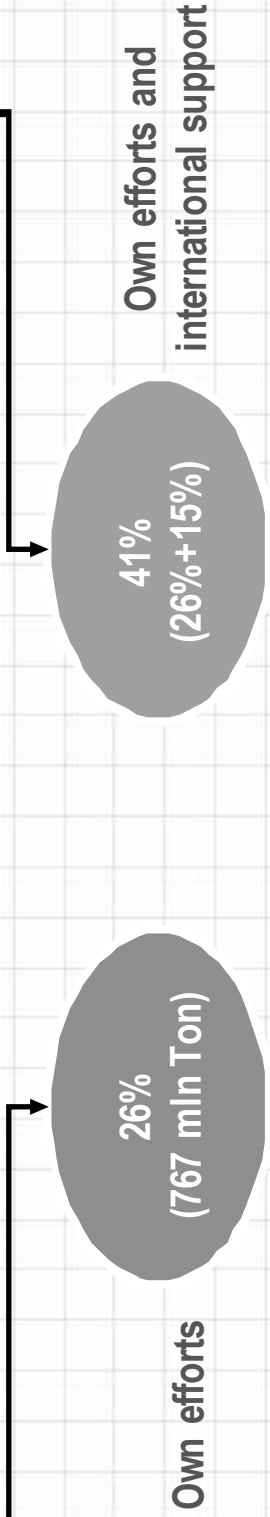
ENERGY SUPPLY SIDE MANAGEMENT ENERGY DEMAND SIDE MANAGEMENT





NATIONAL COMMITMENT TO REDUCE GHG EMISSION

- President Commitment on G-20 Pittsburgh and COP15 To reduce the GHG Emission in 2020
- Presidential Regulation No. 61 & 71 Year 2011

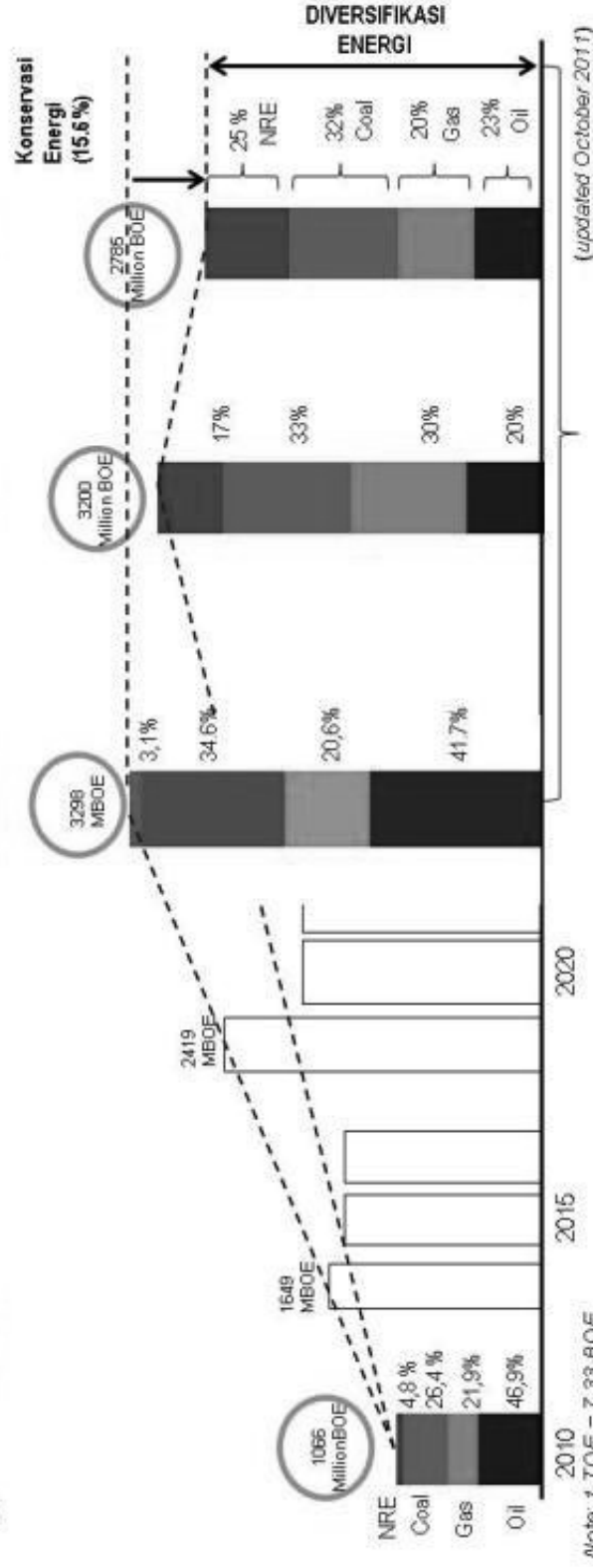
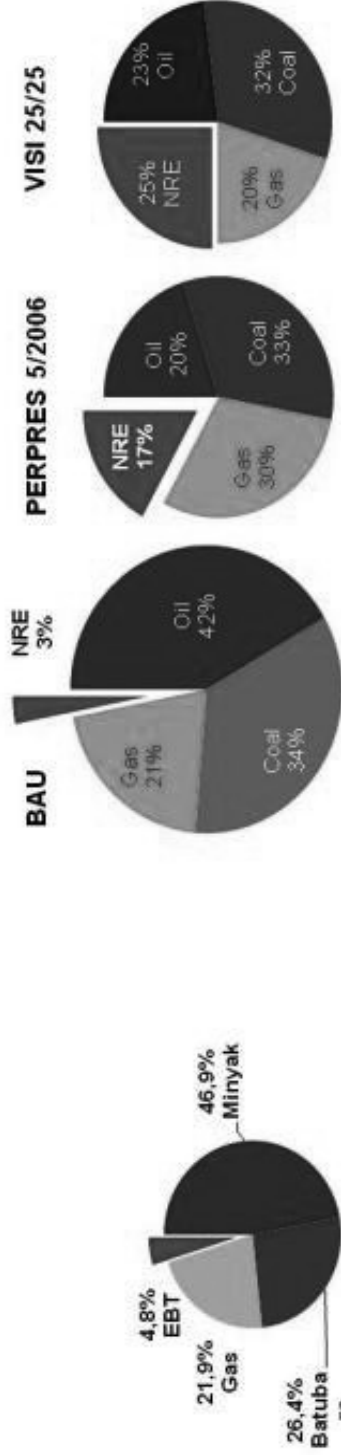


- Forestry, Peat Land, Agriculture (680 million ton)
- Energy Sector (30 million ton)
- Industry and Transportation (9 million ton)
- Waste (48 million ton)

Through the development of new renewable energy and implementing energy conservation by all sectors



ENERGY POLICY



- Concern: *Availability* (Security of energy supply), *Affordability* (Infrastructure availability), *Acceptability* (willingness to pay)
- The future direction of energy policy is to reduce dependence on fossil fuels, especially petroleum;
- Energy policy rests on three pillars: Intensification, Diversification and Conservation;
- Commitment to reduce emissions by 26% - 41% in 2020 mainly Diversification of Energy and Energy Conservation



GREEN BUILDING DEVELOPMENT



REGULATION ON EE&C IN BUILDING SECTOR

- Law No. 28/2002 on Building;
- Law No. 30/2007 on Energy;
- Gov. Regulation PP 70/2009 on Energy Conservation;
- Ministry of Energy & MR Reg. 14/2012 on Energy Management;
- Jakarta Governor Regulation 38/2011 on Green Building;
- Ministry of Manpower Reg. 321 and 323/MEN/XII/2011 on Standard Work Competence for Energy Manager;
- Ministry of Manpower Reg. 614/MEN/IX/2012 on Standard Work Competence for Energy Auditor;
- National Standard for Commercial Building:
 - Energy Audit Procedure, SNI 03-6196-2011;
 - Lighting, SNI 03-6197-2011;
 - Building Envelope, SNI 03-6189-2011;
 - HVAC System, SNI 03-6190-2011;



GREEN BUILDING DEVELOPMENT

- **Institution:**
 - Ministry of Energy and Mineral Resources (efficient building)
 - Ministry of Public Work (green building)
 - Local Government - DKI Jakarta (green building in Jakarta)
 - Green Building Council Indonesia – GBCI
- **Main Programs:**
 - Mandatory on Energy Conservation (MEMR);
 - Green Building Program in Jakarta (Jakarta Government);
 - Greenship, rating system (GBCI);



MANDATORY ON ENERGY CONSERVATION

- Mandatory Energy Conservation for large energy consumer → Industry and Commercial Building (>6000 toe/year):
 - Appoint energy manager;
 - Design energy efficiency program;
 - Conduct regular energy audit and implement the recommendation;
 - Report the energy conservation implementation;
- Support Program:
 - Energy manager (training and certification);
 - Energy auditor (training and certification);

• Energy Conservation for Companies consuming more than 6000 TOE

Article 12
(GR. 70/2009)



RELATED PROGRAM TO SUPPORT ENERGY EFFICIENCY IN BUILDING

- Energy Audit through partnership program;
- Pilot project;
- EE Guidelines for building;
- Local government action on green building;
- Greenship (Indonesia certification on green building)



PARTNERSHIP PROGRAM ON ENERGY AUDIT

YEAR	2003	2004	2006	2007	2009	2010	2011	2012
BUDGET	- (PT. PLN)	- (PT. PLN)	Rp. 2,4 Milyar (APBN)	Rp. 25 Milyar (APBN)	Rp. 4 Milyar (APBN)	Rp. 20 Milyar (APBN)	Rp. 22 Milyar (APBN)	Rp. 18 Milyar (APBN)
PARTICIPANTS	5 industry dan 6 building	3 industry dan 6 building	21 industry dan 11 building	138 industry dan 62 building	16 industry dan 24 building	105 industry dan 55 building	125 industry dan 70 building	115 industry dan 65 building
TOTAL OF SAVING POTENTIAL	78,4 GWh = Rp. 50,8 Milyar = 70,6 Kilo Ton CO2	14, 8 GWh = Rp. 6,9 Milyar = 13,32 Kilo Ton CO2	40,7 GWh = Rp. 40,4 Milyar = 36,6 Kilo Ton CO2	519 GWh = Rp. 289 Milyar = 467,1 Kilo Ton CO2	34 GWh = Rp. 23,8 Milyar = 30 Kilo Ton CO2	725 GWh = Rp. 450 Milyar = 645 Kilo Ton CO2		
TOTAL OF ENERGY SAVING ACHIEVEMENT	34,4 GWh = Rp. 22,2 Milyar = 40 Kilo Ton CO2	14,1 GWh = Rp. 8,2 Milyar = 12,7 Kilo Ton CO2	30,1 GWh = Rp. 19,9 Milyar = 27,1 Kilo Ton CO2	307 GWh = Rp. 168, 8 Milyar = 276,3 Kilo Ton CO2	15 GWh = Rp. 10,7 Milyar = 13,6 Kilo Ton CO2	175 GWh = Rp. 110 Milyar = 157 Kilo Ton CO2		

Total 804
(2003-2012)

- Energy savings are generally obtained from energy saving measures that recommendation is no cost and low cost (management)
- There are opportunities to achieve greater energy savings if recommendations medium cost and high cost are also implemented
- Some of recommendation is not yet implemented because of limited funding



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PILOT PROJECT EFFICIENT BUILDING BİTİRİLMİŞ PROJESİ VERİMLİ BİNA





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EE GUIDELINES FOR BUILDING SECTOR



Developer & Building
Owner



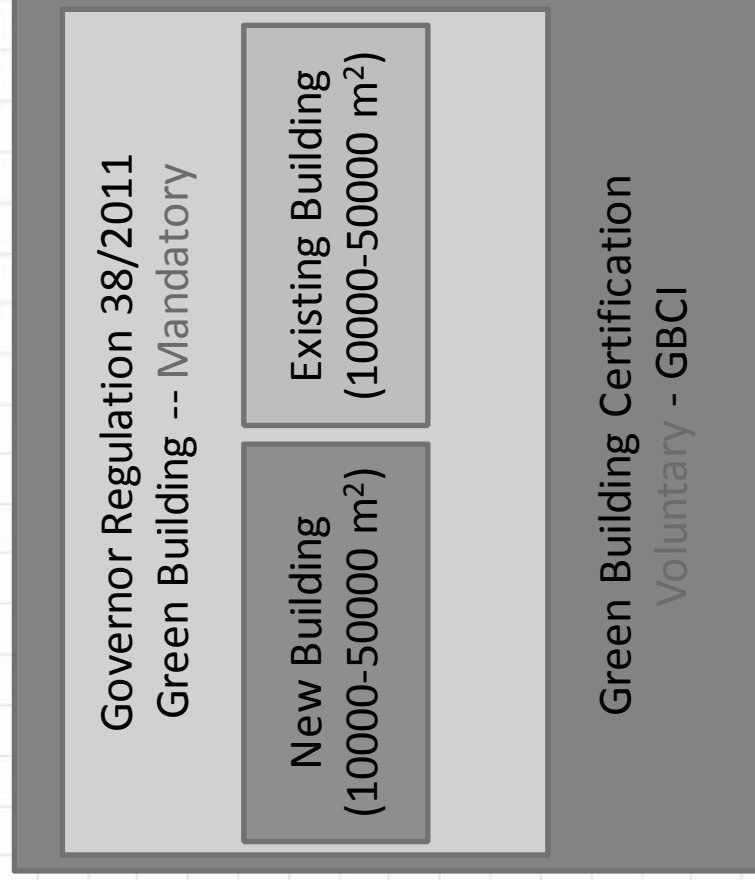
EE Technical Design
Guidelines



Case Study



GREEN BUILDING PROGRAM (JAKARTA PROVINCE)



Criteria for New building:

- Energy efficiency;
- Water efficiency;
- Air quality;
- Land and waste management;
- Management of building during construction;

Criteria for Existing building:

- Energy efficiency and conservation
- Water efficiency and conservation
- Air quality
- Management operational of building

• Enforcement regulation:

- Through building permit and/or certificates feasibility of building;
- New/existing building which are not comply with Jakarta green building criteria, are not be allowed to continue;



GREENSHIP

Indonesia Rating System for Green Building

- GREENSHIP Rating System, an assessment tool developed by the Green Building Council of Indonesia (GBCI) to determine whether a building can be declared eligible certified "green building" or not;
- GREENSHIP certification program organized by the Commission GBCI Rating credible, accountable and integrity;
- The preparation of this GREENSHIP supported by the World Green Building Council, and implemented by the Commission rating of GBCI.





GREENSHIP AS A RATING SYSTEM IS DIVIDED INTO SIX ASPECTS

1. Appropriate Land Use (Appropriate Site Development / ASD)
2. Energy Efficiency & refrigerants (Energy Efficiency & Refrigerant / EER)
3. Conservation of Water (Water Conservation / WAC)
4. Source & Cycle Materials (Materials & Cycle Resources / MRC)
5. Air Quality & Leisure Air (Water Indoor Health & Comfort / IHC)
6. Environmental Management Building (Building & Environment Management)

Recognition Achievement:

- Platinum
- Gold
- Silver
- Bronze

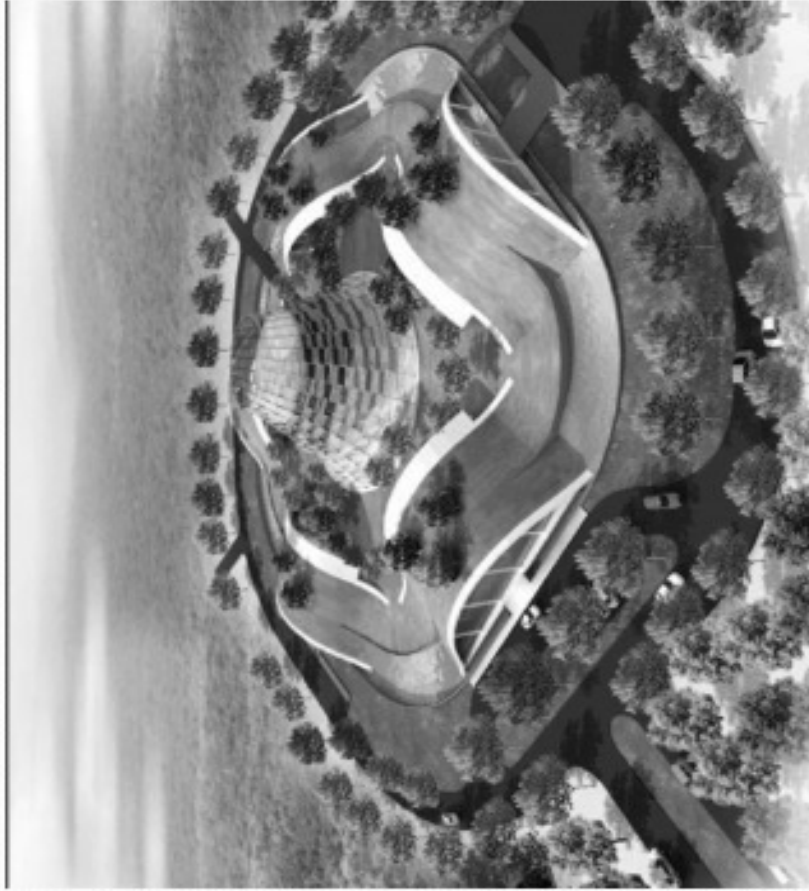


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GEDUNG PT Dahana

New Building

Air Conditioning and Ventilation → Building Management System, Temperature Control, Environmentally-friendly chillers and refrigerant

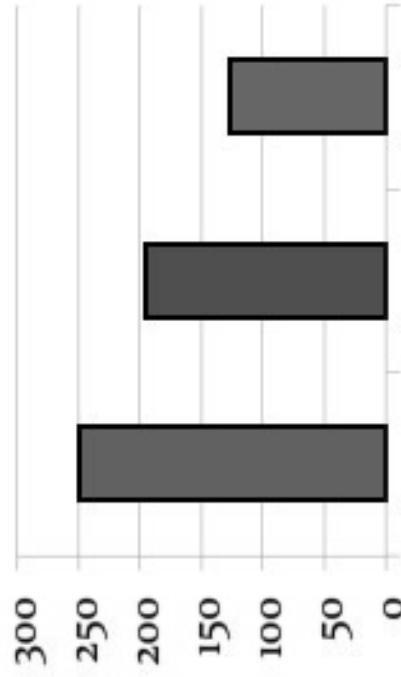


**First GB based of NB GreenShip
– Platinum**



GREEN
BUILDING
COUNCIL
INDONESIA

EEI (KWH/m².yr)



Average Office
Dahana (G.Baseline)
Dahana (G.Disain)

Saving 42%



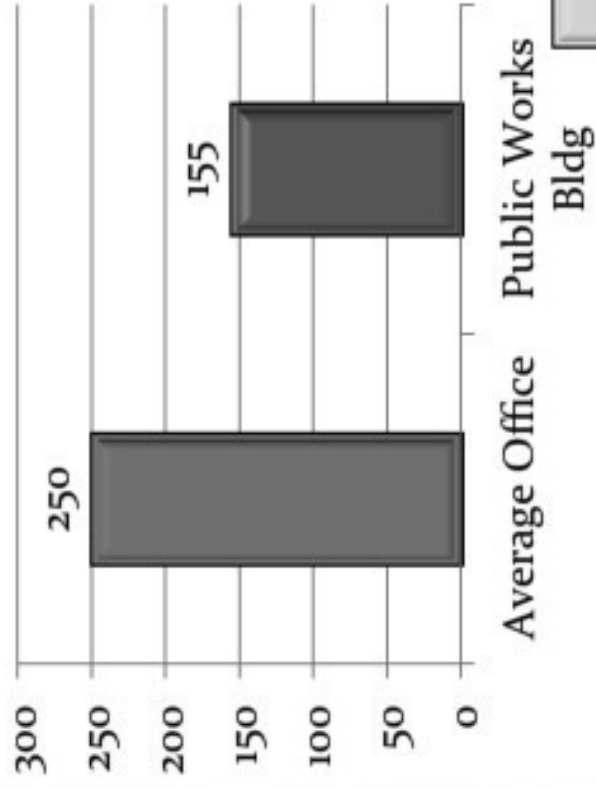
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PEMBERI TUGAS

DEPARTEMEN PEKERJAAN UMUM
SEKRETARIAT JENDERAL
SNVT-PENGEMBANGAN, PENGENDALIAN
DAN PELAKSANAAN PEKERJAAN STRATEGIS BIDANG PU LAINNYA

Public Works Ministry Office

EEI (KWH/m².yr)



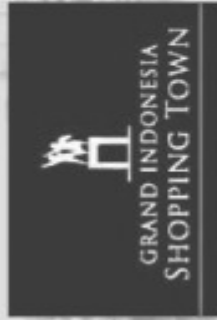
Saving 38%

Design Recognition : PLATINUM





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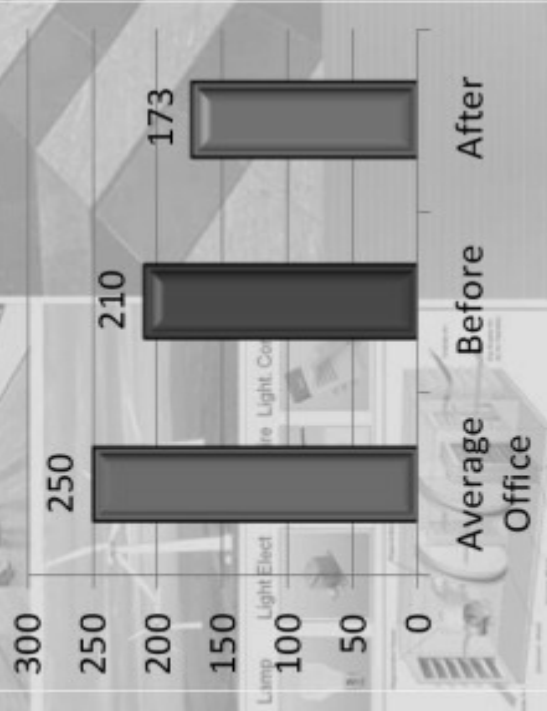


Existing Building



PLATINUM
GREENSHIP Existing Building
Achieved: 21 Desember 2011

EEI (kWh/m².yr)



Saving vs Ave : 30%
Saving vs Previ : 18,6%



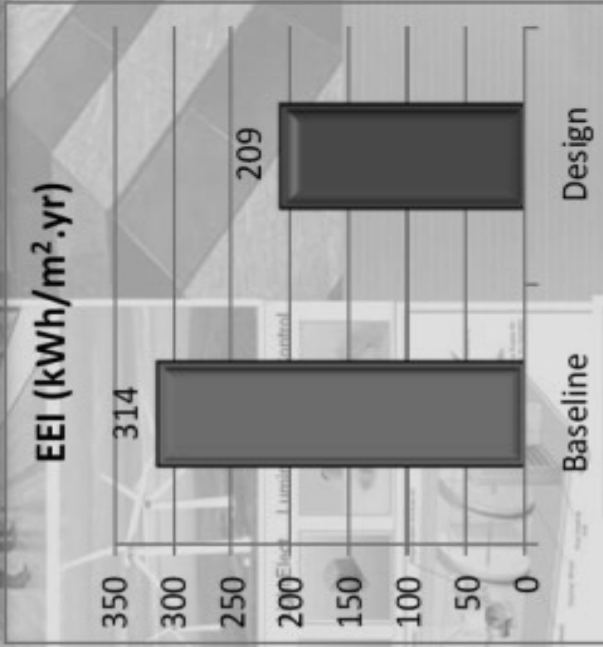
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Ministry of Energy and Mineral Resources

ITSB Campus



GOLD

**Design Recognition Award
GREENSHIP New Building
Dated: 1 Desember 2011**

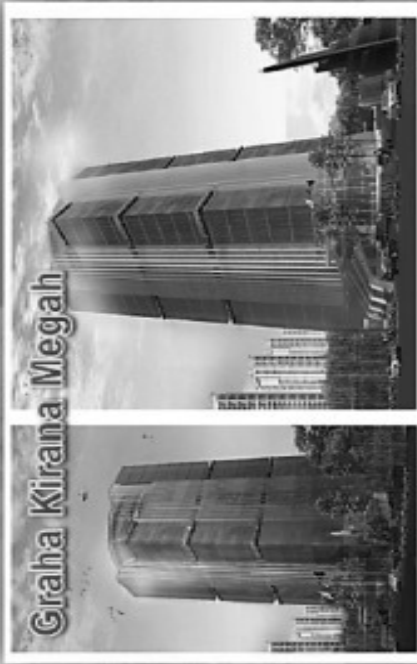


Saving 33.4%

- ENERGY**
 - MEASURE ENERGY CONSUMPTION (saving 33,35%)
 - ENERGY EFFICIENCY BY USING NATURAL LIGHTING, TAKING BUILDING ENVELOPE INTO CITY ACCOUNT, REDUCE ENERGY USING
- SITES**
 - GREENING AREA AND MIND THE ALBEDO SETTING
 - STORMWATER MANAGEMENT
 - BICYCLE PATH, PARKING AND SHOWER FOR BICYCLE USER
- WATER**
 - MEASURE ENERGY CONSUMPTION
 - WATER EFFICIENCY BY USING GREEN WATER FIXTURES & RAINWATER HARVESTING
- MATERIAL**
 - USING MATERIAL : ISO 14001 OR EQUAL, REGIONAL MATERIAL (PRODUCE IN AREA THAT NOT MORE THAN 1000 KM RADIUS)
 - FUNDAMENTAL REFRIGERANT AND NON ODS USAGE
- INDOOR HEALTH & COMFORT**
 - CO2 MONITORING AND FRESH AIR INTAKE
 - LOW VOC FOR PAINT, NOT USING MATERIAL THAT CONTAIN FORMALDEHYDE, ASBESTOS, MERCURY AND STYROFOAM
- BUILDING MANAGEMENT**
 - PROPER COMMISSIONING
 - WASTE MANAGEMENT
- COST ANALYSIS**
 - COST ANALYSIS BETWEEN GREEN BUILDING VS STANDART BUILDING
 - PAYBACK PERIOD ANALYSIS = 7,7 YEARS



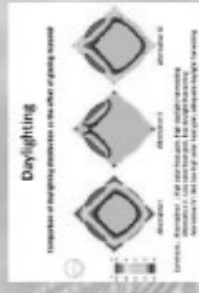
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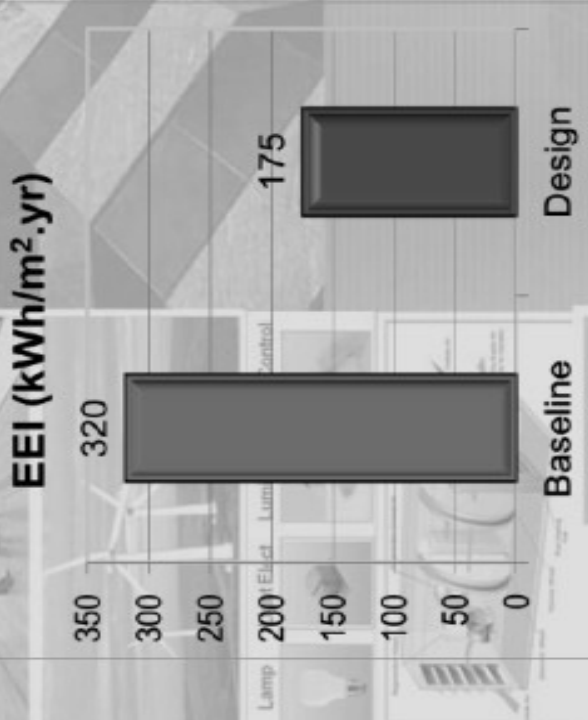
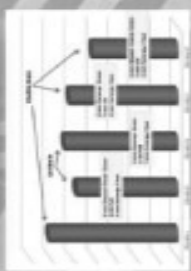
Graha Kirana Megah



Platinum - Target Design Recognition Award GREENSHIP New Building Dated: Nov 2012



Item	Alternative 1	Alternative 2	Alternative 3
Area (m ²)	117	117	117
Volume (m ³)	117	117	117
Window Area (m ²)	117	117	117
Window-to-Floor Ratio	0.1	0.1	0.1
Window-to-Volume Ratio	0.00085	0.00085	0.00085
Window-to-Floor Area Ratio	0.1	0.1	0.1
Window-to-Volume Ratio	0.00085	0.00085	0.00085
Window-to-Floor Area Ratio	0.1	0.1	0.1
Window-to-Volume Ratio	0.00085	0.00085	0.00085
Window-to-Floor Area Ratio	0.1	0.1	0.1
Window-to-Volume Ratio	0.00085	0.00085	0.00085



Saving 45.3%



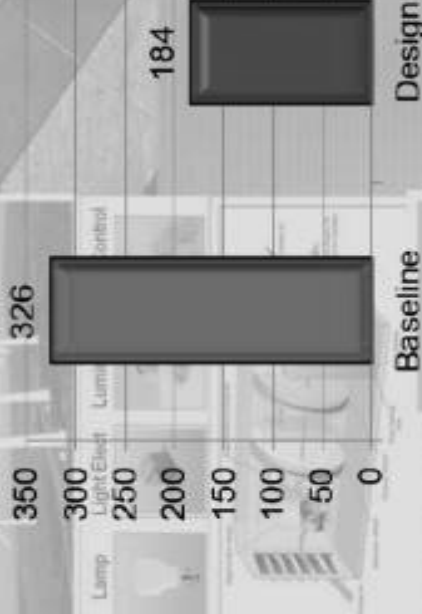


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PRASETIYA MULYA BUSINESS SCHOOL



EEI (kWh/m².yr)



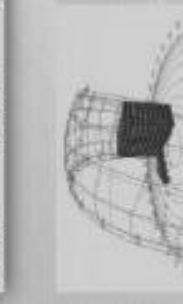
Saving 43.6%

Platinum - Target Design Recognition Award GREENSHIP New Building Dated: Dec 2012



KOMPARASI 1	KOMPARASI 2	KOMPARASI 3
<ol style="list-style-type: none"> CLEAR GLASS WINDOW BM SUPERGLASS WINDOW BM STOPPOOL CLASSIC WINDOW BM STOPPOOL CLASSIC GREEN ROOM FIVE STOPPOOL CLASSIC GREEN LABEL 0 	<ol style="list-style-type: none"> CLEAR GLASS WINDOW BM STOPPOOL CLASSIC WINDOW BM STOPPOOL CLASSIC GREEN ROOM FIVE STOPPOOL CLASSIC GREEN LABEL 0 	<ol style="list-style-type: none"> CLEAR GLASS WINDOW BM STOPPOOL CLASSIC WINDOW BM STOPPOOL CLASSIC GREEN ROOM FIVE STOPPOOL CLASSIC GREEN LABEL 0
DTTV 12.82	DTTV 11.53	DTTV 10.98
1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 Number / Address	1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 Number / Address	1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 1-4 11.53, 12.049 Number / Address

KOMPARASI 1	KOMPARASI 2	KOMPARASI 3
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Category	Value
Energy Savings	184
Lighting Savings	52,795,858
Maintenance Savings	3.5

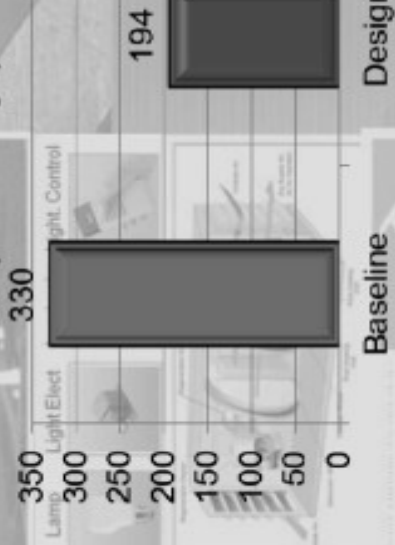
Category	Value
Energy Savings (over 20 Yr)	184
% Savings Electrical	52,795,858
Lighting Savings (over 20 Yr)	52,795,858
Dynamic Payback Based on energy and maintenance savings over 20 Yr	3.5



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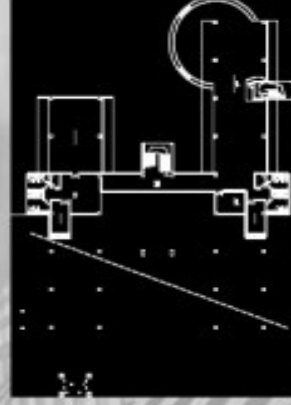


EEI (kWh/m².yr)



Saving 41.2%

Platinum - Target Design Recognition Award GREENSHIP New Building Dated: Dec 2012

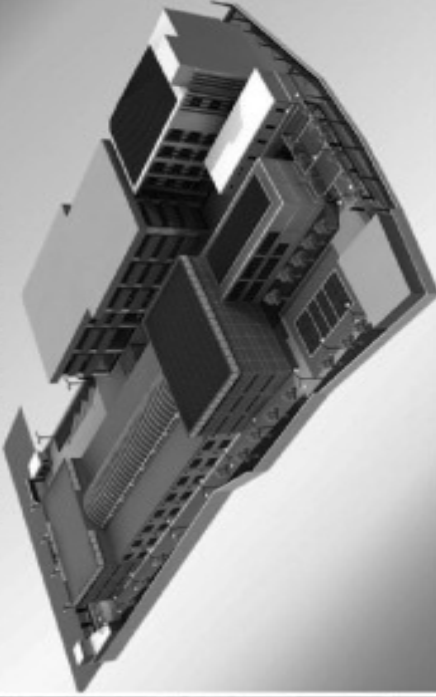


Tipe	Perhitungan		SNI 1746	SNI 1745	SNI 1744	SNI 1743	SNI 1742	SNI 1741	SNI 1740
	U	U ₀							
1740	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
1741	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
1742	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
1743	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
1744	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
1745	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75





BITIKRASI BANGUNAN BERTERBUK TAPAK TAMPAK BELAKANG



Wisma Pusdiklat KEBTKE

Platinum - Target

Design Recognition Award

GREENSHIP New Building

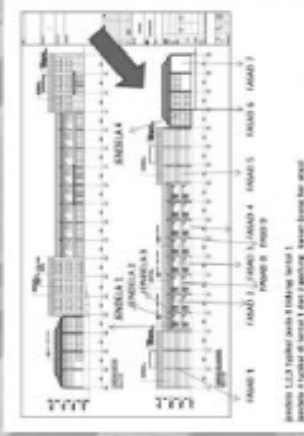
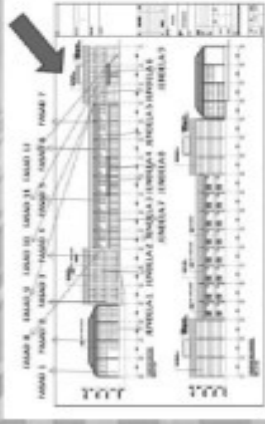
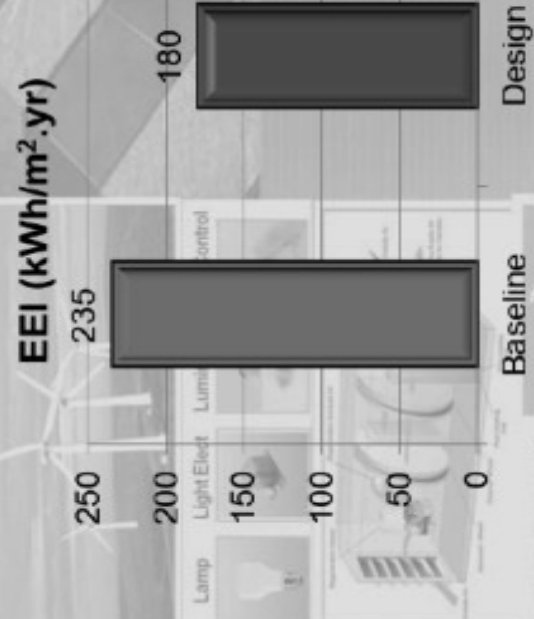
Dated: Dec 2012



NO	REKAM DATA PERALAN BERKUMBUH	REKAM DATA PERALAN BERKUMBUH	REKAM DATA PERALAN BERKUMBUH
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POTONGAN DESAIN LANDESKAP PENINGKATAN DEBAYU

Saving 23.4%



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Ministry of Energy and Mineral Resources

SAVE
ENERGY!

Thank You!



MINISTRY OF ENERGY AND MINERAL RESOURCES REPUBLIC OF INDONESIA
DIREKTORAT GENERAL OF NEW, RENEWABLE ENERGY, AND ENERGY CONSERVATION

Jalan Jenderal Gatot Subroto, Kav. 49 Jakarta 12950; Telp/Faks : 021-5250575

www.ebtke.esdm.go.id

www.energiarterbarukan.net

www.konservasienergi.net