

## **Trade and Environmental Issues for Energy Systems/Services**

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Roundtable on Issues Related to the Establishment and Activation of  
National Committees on Trade and Environment  
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## **Outlines**

### **A. Why Green Trading for Energy Systems/Services?**

### **B. Energy Systems: Definition & Examples.**

- Equipments and systems
- Fuels

### **C. Energy Efficiency and Environmental Considerations for Energy Equipment and Fuel Trading.**

- Energy Efficiency and Emissions for Selected Energy Equipments/Systems.
- Environmental Considerations for Fuels Trading (NG, Gasoline & Diesel).

### **D. Towards Implementation of Green Trading/Procurement of Energy Systems/Services**

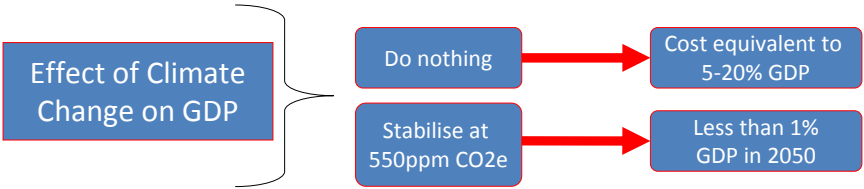
- Core Requirements and Approach
- How to Move Forward
- Determination of Priority Areas and Evaluation of the Options
- Barriers of Implementation
- Mechanism for Implementing

(A)

**Why Green Trading for  
Energy Systems/ Services?**

**Environmental Sustainability Challenge**

- The great challenge faced by economies today is to integrate environmental sustainability with economic growth and welfare by decoupling environmental degradation from economic growth and doing more with less.



### **The Importance of Green Trading/Procurement of Energy Systems/Services**

- It reduces the emission from source
- It is very effective in GHG mitigation
- Prevention is better than Correction

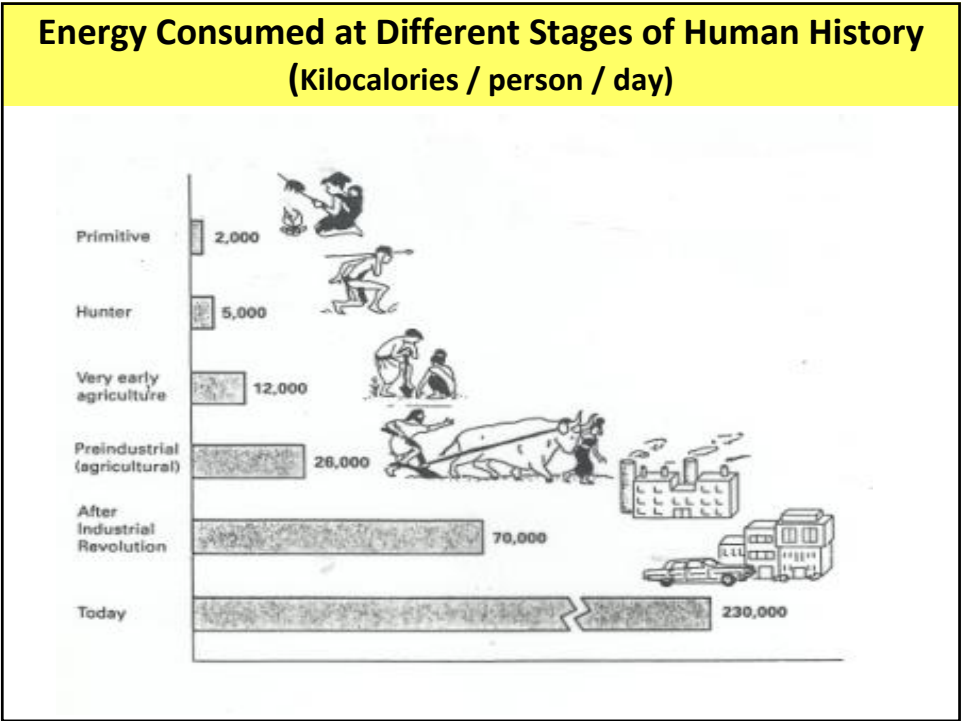
**(B)**

### **Energy Systems: Definition & Examples**

- Any system/equipment used for energy production, conversion, storage, transportation and utilization.
- There are thousands of energy systems/equipments “separate & integrated”

**The following are few examples:**

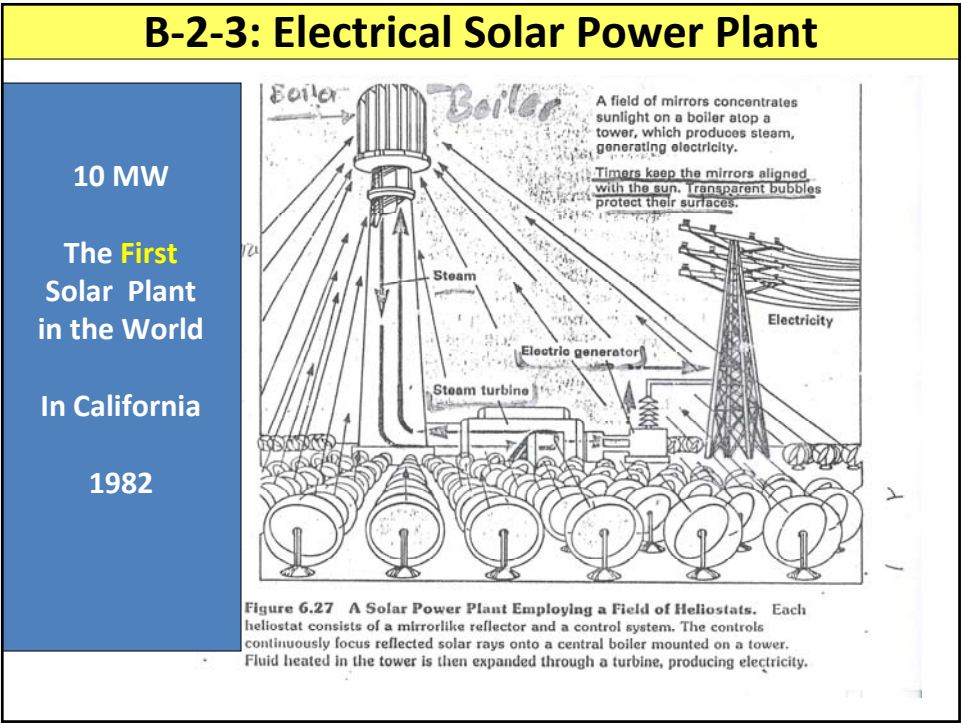
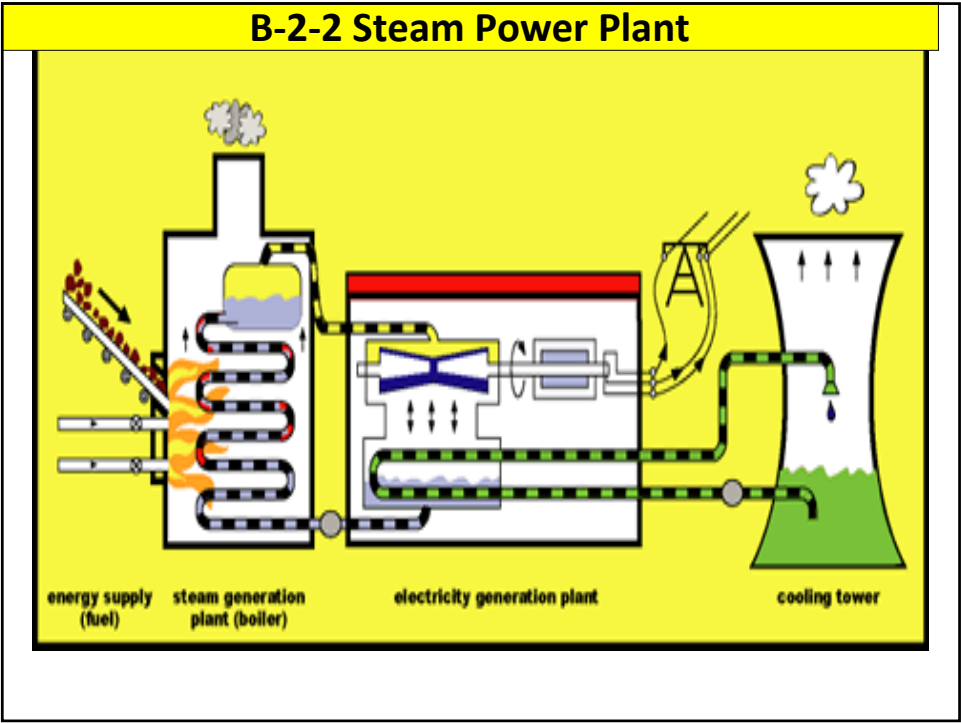




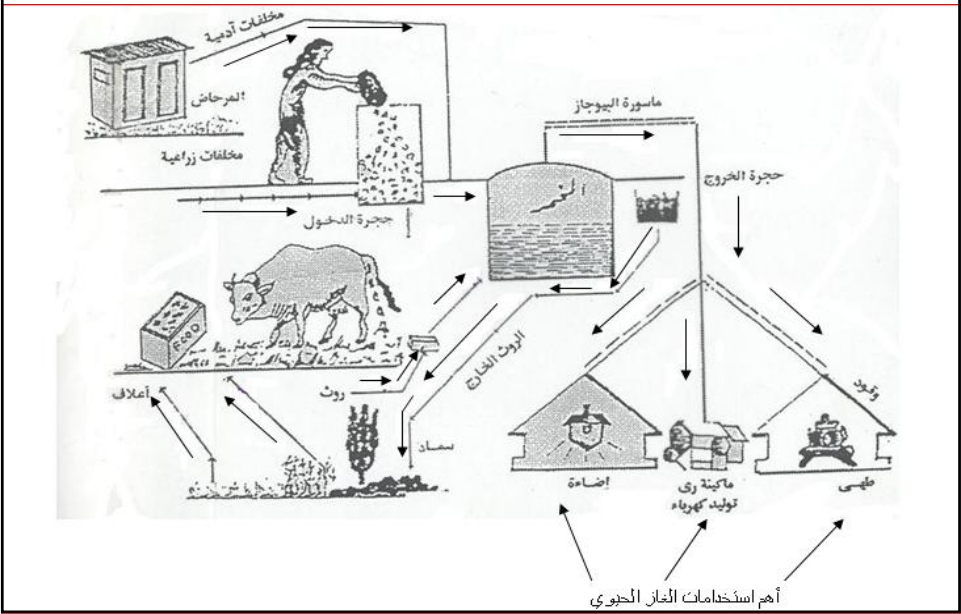
**B-1: Separate Energy Equipments**

<b>Diesel generator</b> 	<b>Compressor</b> 	<b>Pump</b> 	<b>Elec. motor</b> 	<b>Steam boiler</b> 
<b>Lamps</b> 	<b>Fan</b> 	<b>Insulation material</b> 		

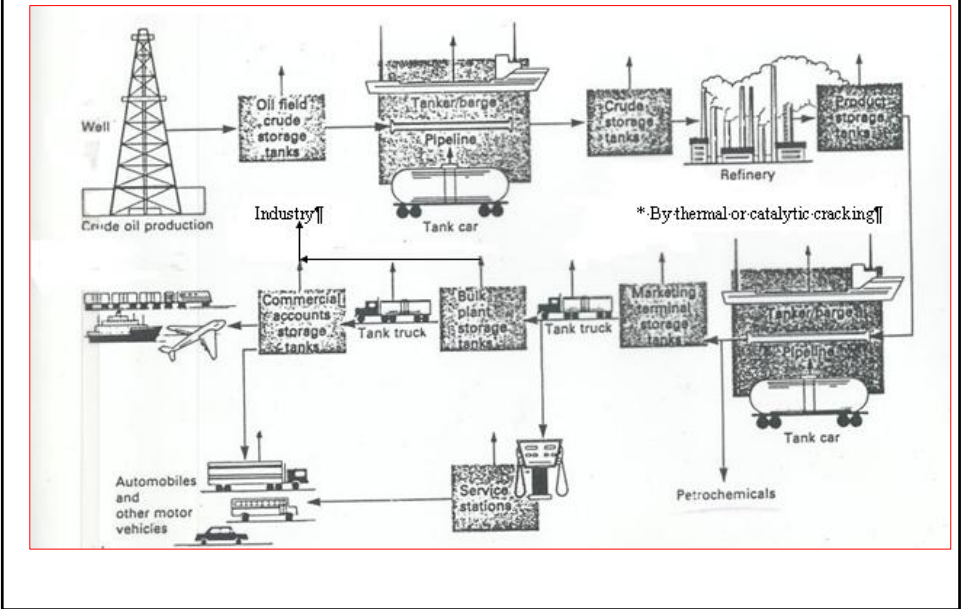




**B-2-4: Bio-gas System: Production & Uses**

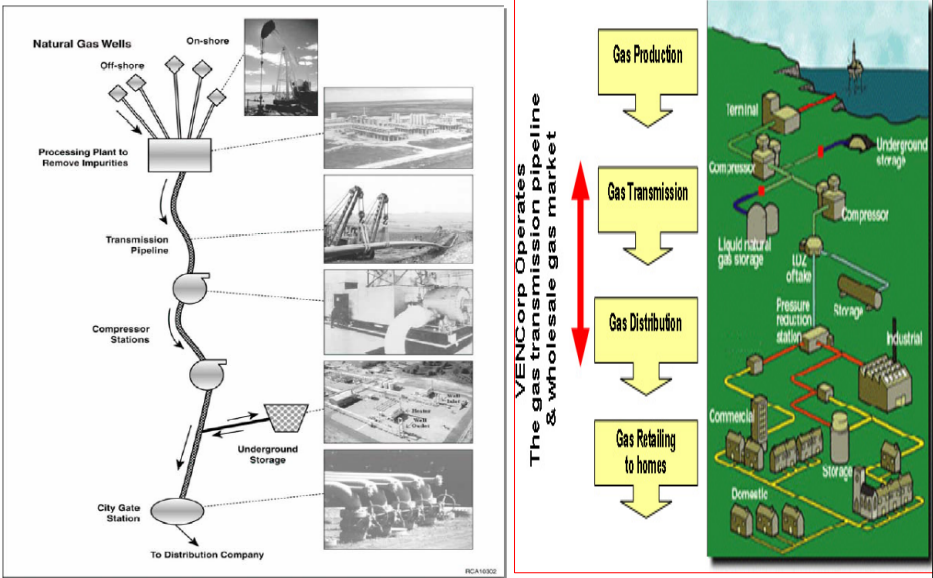


**B-2-5: Oil Production, Storage and Transportation System**

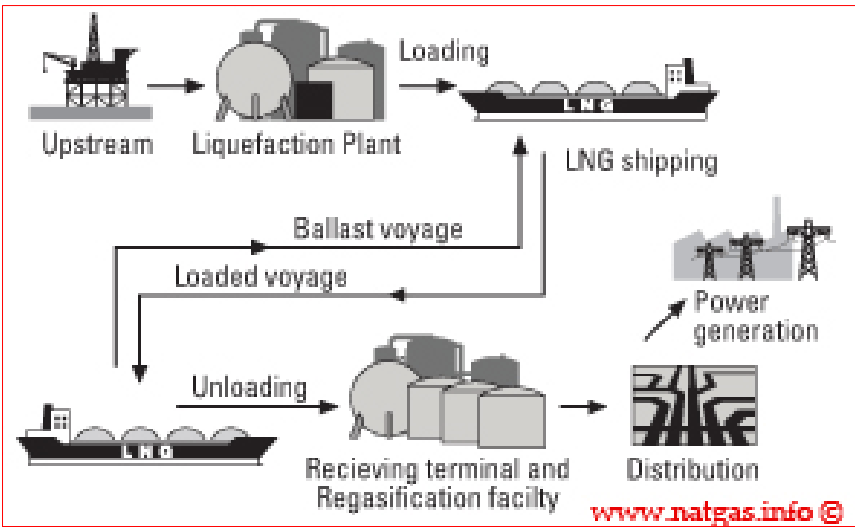




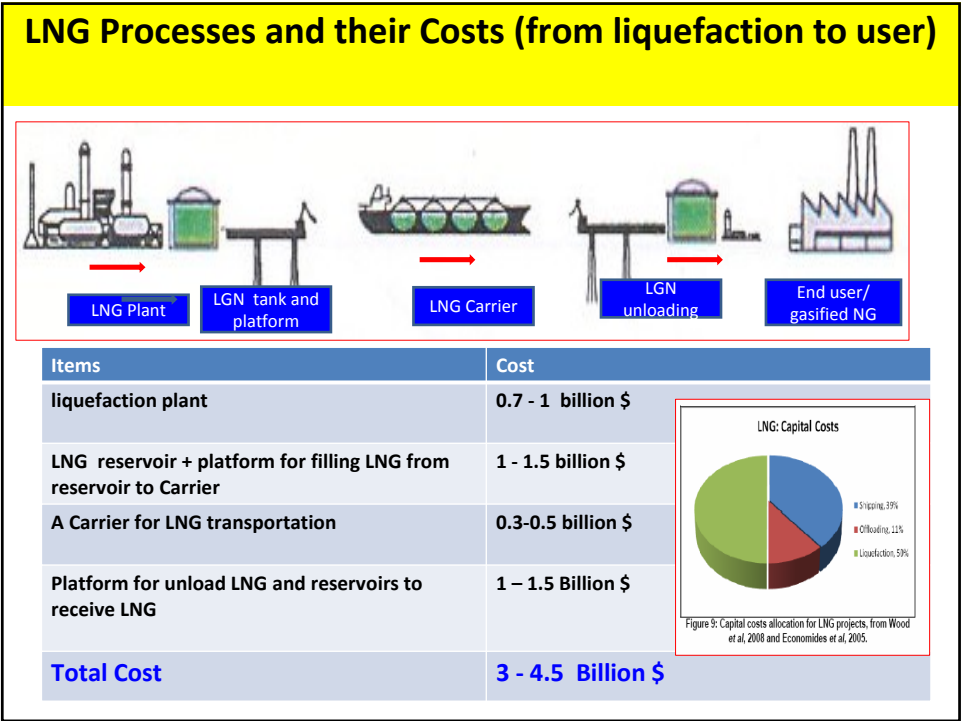
**B-2-6: Natural Gas Transportation System “by pipeline”: Production, Processing, Transmission, and Storage**



**B-2-7: Natural Gas Transportation System “by LNG”**





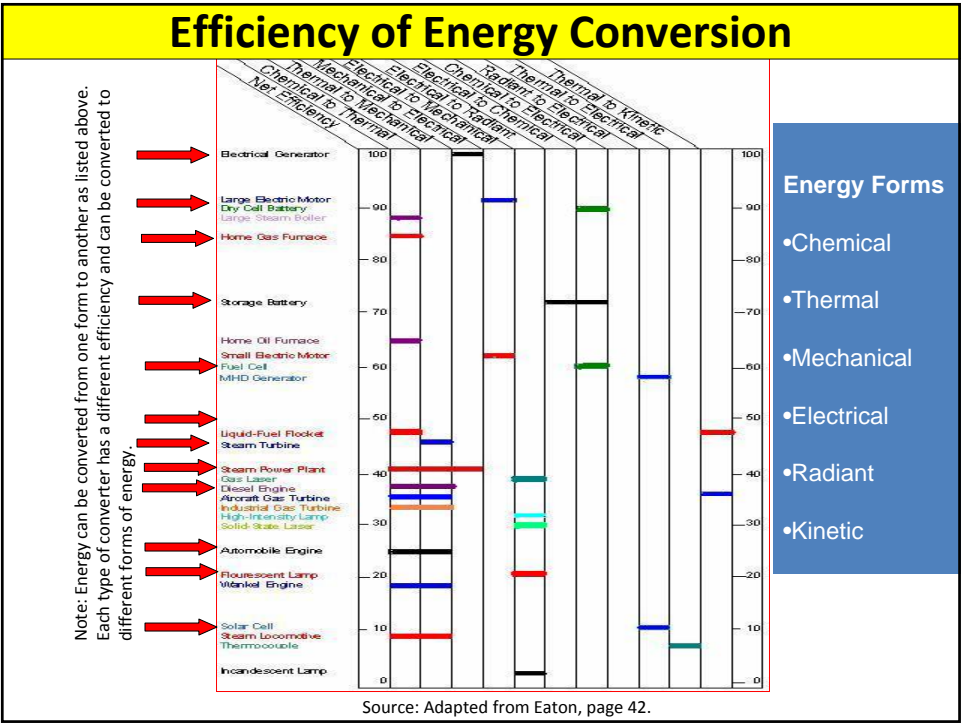


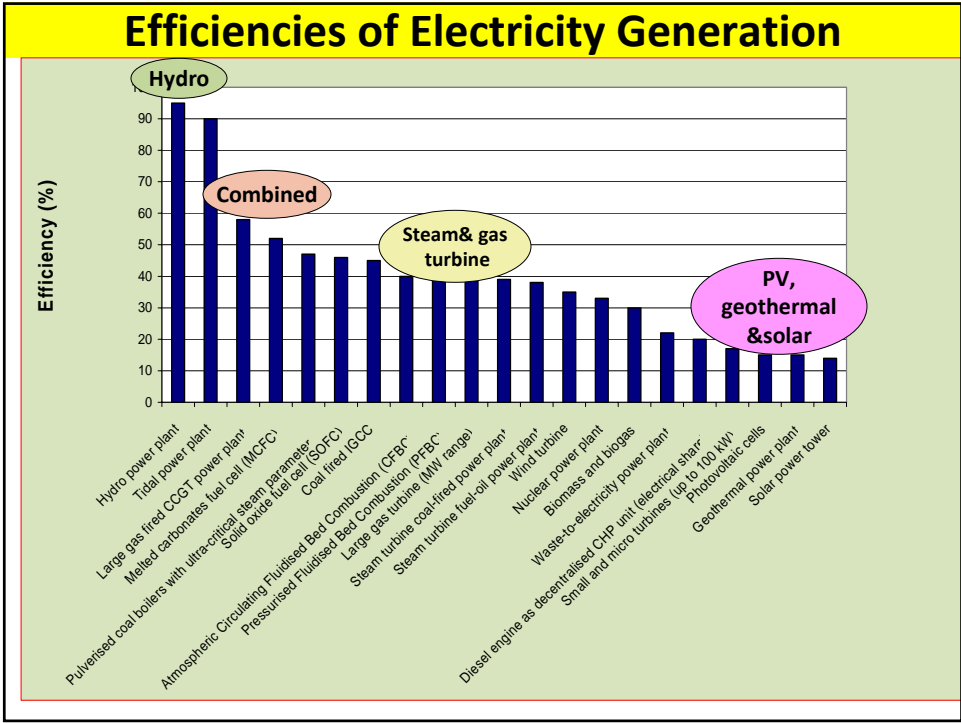
**B-3: Fuels**

- Oil and its products “mainly gasoline, diesel”
- Natural Gas
- Coal
- Nuclear
- Others

( C )

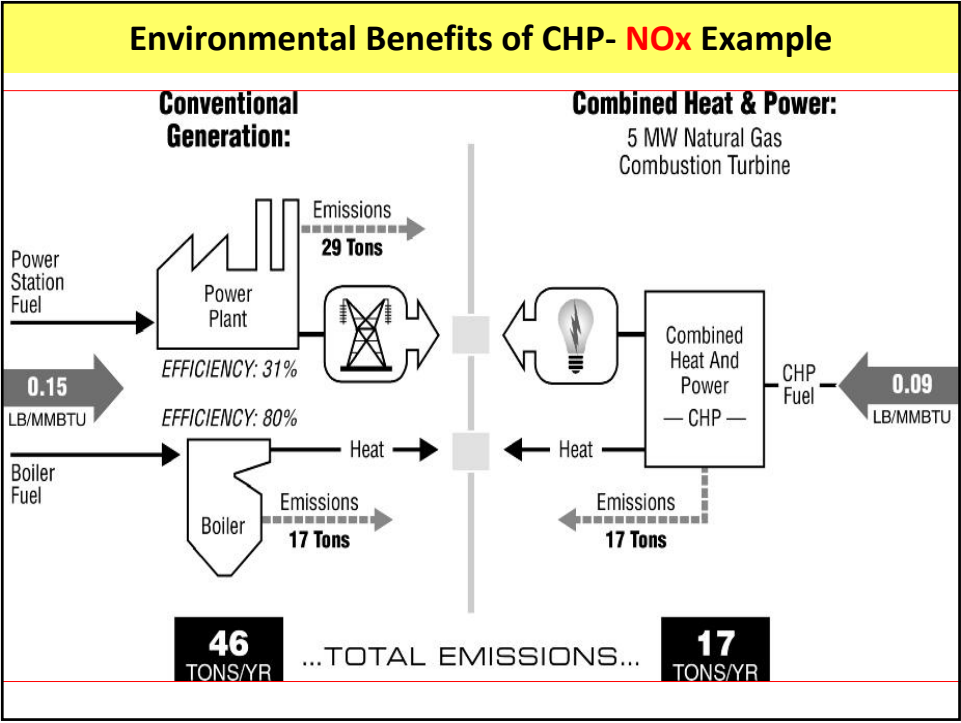
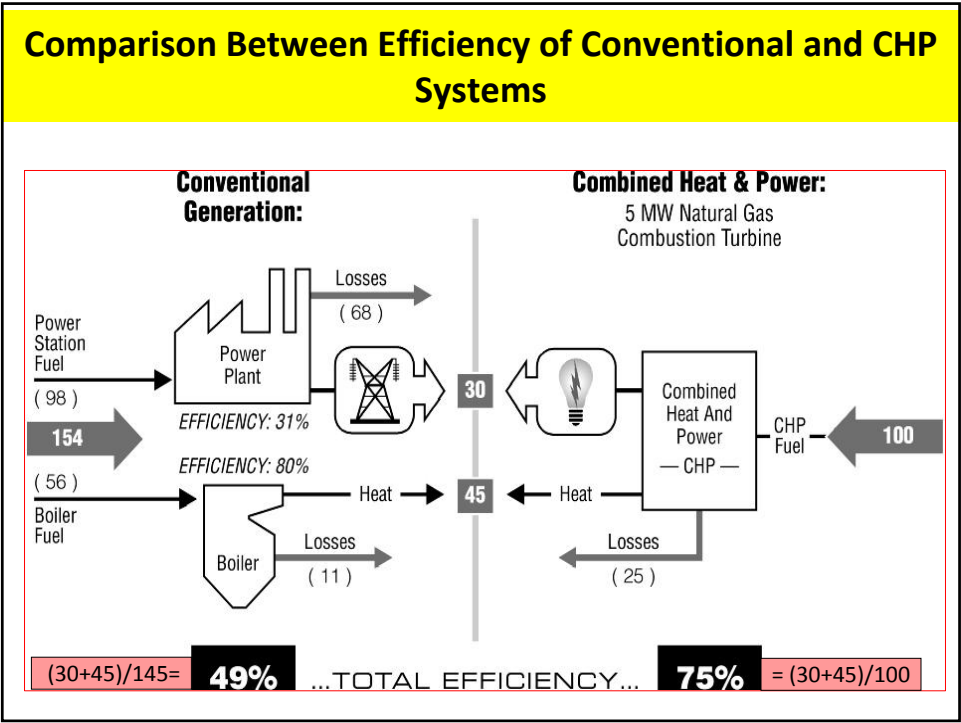
Energy Efficiency and  
Environmental Issues for  
Energy Systems/Services



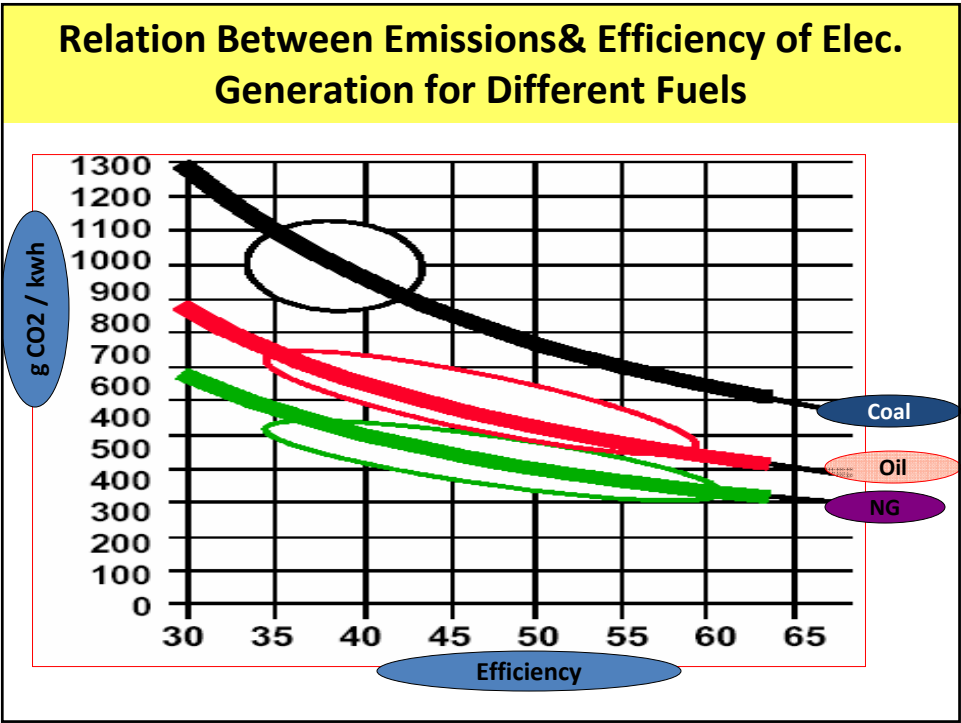


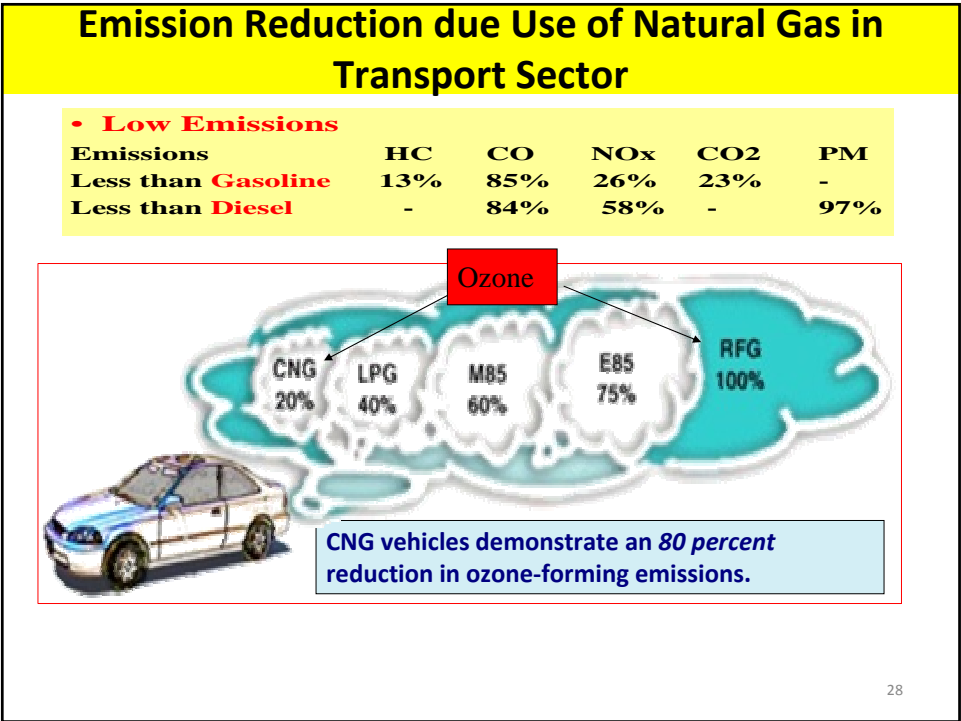
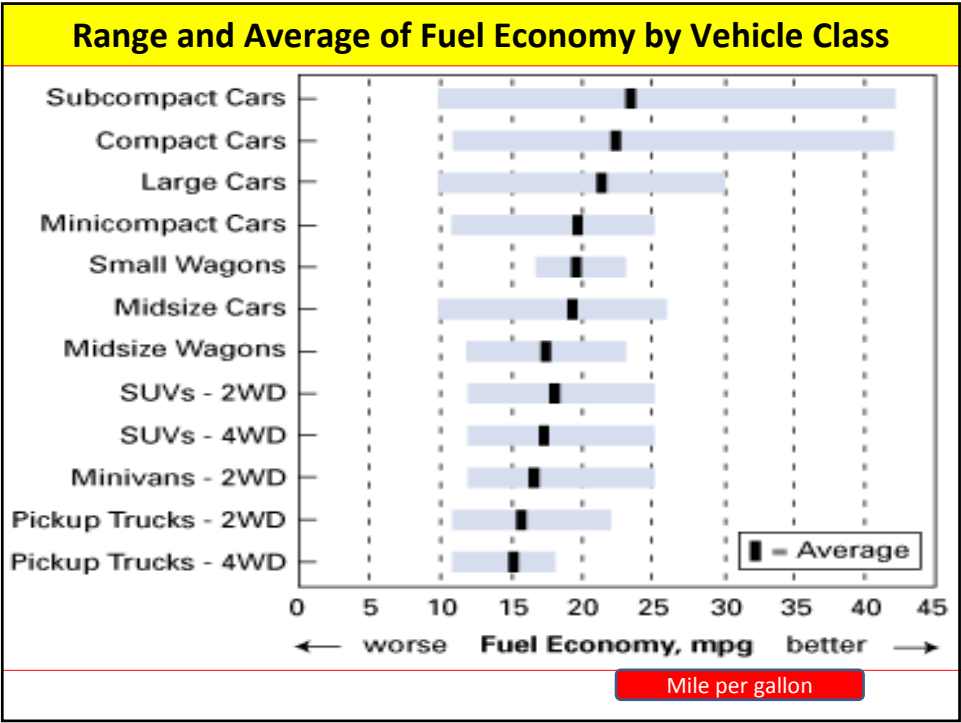
### Common Power Cycle Thermal Efficiencies

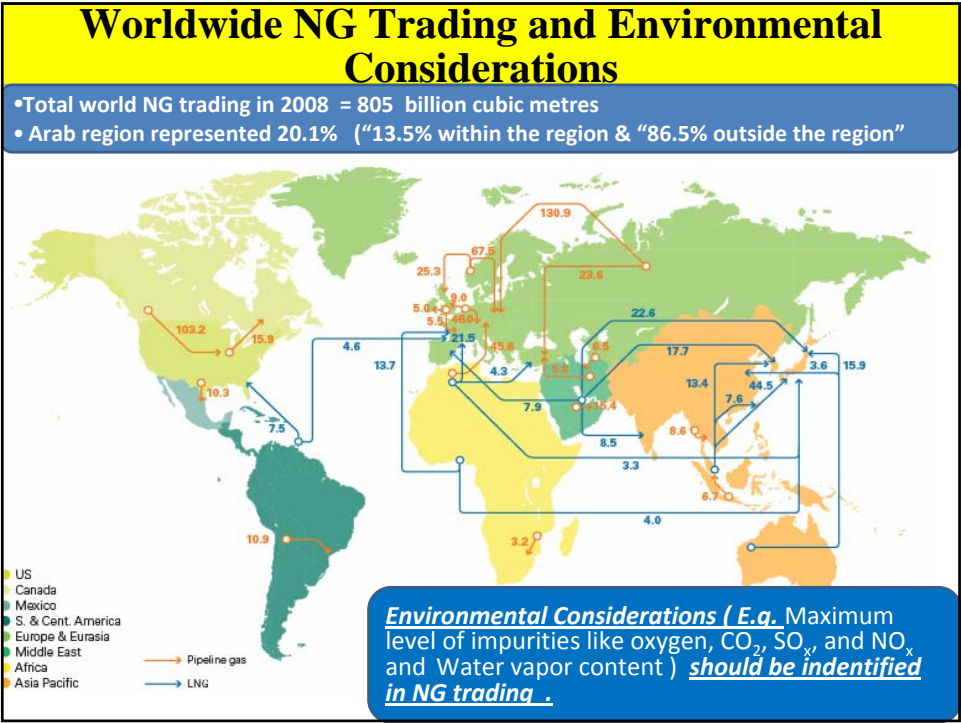
- **Simple Steam Cycle** **25% - 35%**
  - Generate steam at high pressure exhaust steam from steam turbine to condenser.
- **Simple Gas Turbine** **30% - 35%**
  - Gas Turbine driven generator with exhaust to atmosphere.
- **Combined Cycle** **50% - 60%**
  - Gas Turbine driven generator with exhaust used to make high pressure steam, and high pressure steam used to generate additional electricity in steam turbine.
- **Gas Turbine-Process Steam** **75% - 85%**
  - Gas Turbine driven generator with exhaust used to make low pressure steam for process.



Comparison Between <b>300 MW</b> Oil-fired power and Natural Gas Combined Cycle Plants (Efficiency and CO2 Emission)			
Items	Oil-fired power plant (300 MW)	Natural gas-fire combined cycle (300 MW)	Improvement
Efficiency	38%	56%	47%
CO2 emissions (g/kWh)	740	360	50%
Total CO2 emissions (Mt/y)	1.30	0.65	50%
CO2 emissions (g/kWh)	740	360	50%







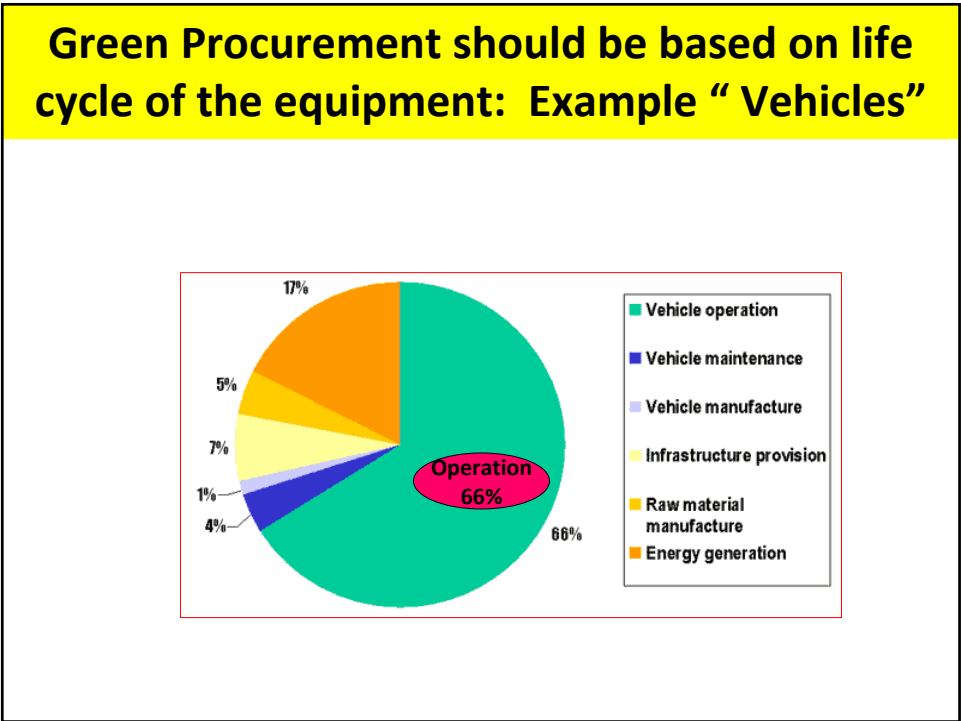
### Specifications/ Standards of Gasoline and Diesel

#### “According to Euro Standards”

<u>A) Gasoline:</u>	
• Lead and metals	zero (0)
• Benzene (C <sub>6</sub> H <sub>6</sub> )	1 % volume
• Sulphur	40 ppm
• Olefins	4.3 % volume
• Aromatics	25 % Vapour
<u>B) Diesel:</u>	
• Cetane number	higher than 51
• Sulphur	500-50 ppm
• Aromatics	10 % volume
• Nitrogen	10-20 ppm



Emission Reduction in Transport Sector in the Arab Region		
“If Fuel Specifications Match with Euro Norms”		
Emissions	Reduction	
	Gasoline	Diesel
<hr/>		
• Carbon dioxide (CO <sub>2</sub> )	6.8 %	14.7%
• Nitrogen oxides (NO <sub>x</sub> )	17.2 %	16 %
• Carbon monoxide (CO)	39.2 %	54%
• Particulate matters (PMs)	35 %	
42.3 %		
• Hydrocarbon (HC)	22.7 %	56.5%
• Volatile organic compounds (VOCs)	--	38.7%

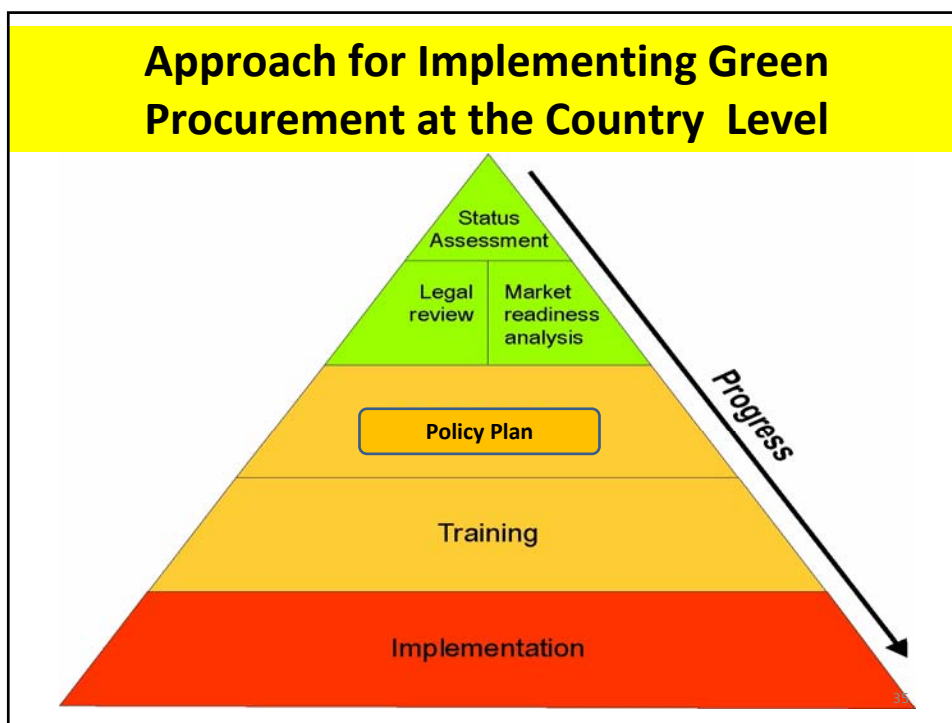


**(D)**

**Towards Implementation of Green  
Trading/Procurement of Energy  
Systems/Services**

**Core Requirements**

- a) Institutional development and  
Identification of stakeholders.**
- b) Policies/ regulations/legislations  
development**
- c) Capacity building , information  
dissemination and awareness**



### How to Move Forward

- **Get well informed on the benefits of green trading/procurement of energy systems**
- **Identify the priority areas** “low cost & implement easily): **Example**
- **Open discuss with all stakeholders** (finance, procurers, suppliers, private sector, governmental sector)
- **Build contacts with other authorities** (local or abroad)
- **Define the action plan**, get political support and follow-up its implementation

Determination of Priority Areas

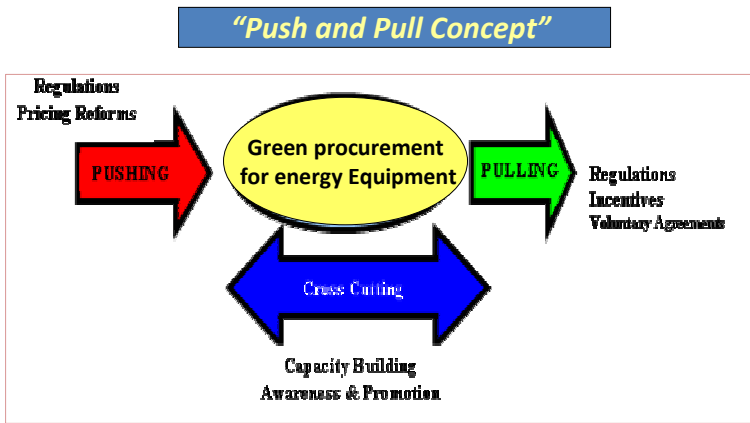
Selection Criteria should be Based on Environmental, Economic and Social Considerations		
Criteria	Weight (%)	Basis for scoring
1. Level of emission reduction	30	<div>Score</div> <div>↑</div>
2. Cost of implementation	25	<div>↓</div>
3. Running costs	10	<div>↓</div>
4. Side benefits “e.g. Job creation”	10	<div>↑</div>
5. Intensity of equipment in the market “energy consumption”	15	<div>↑</div>
6. Social & political considerations	10	<div>↑</div>
Total	100%	

Ranking of Priority Areas ( <i>Evaluation Matrix</i> )							
6 Criteria  4 equipments  Wight	Level of emission reduction	Cost of implementation	Running costs	Side benefits	Intensity of equipment in the market	Social & political considerations	Ranking of the equipments
	30%	25%	10%	10%	15%	10%	
1-Electrical motors	$(8.5 \times 30\%) + (9 \times 25\%) + (5 \times 10\%) + (7 \times 10\%) + (8 \times 15\%) + (7 \times 10\%)$						7.9 (3rd)
	8.5	9	5	7	8	7	
2- Air Conditioning	9	9	7	8	8.5	6.5	8.4 (2nd)
3-Electrical Lamps	8	5	6	7	7.5	8.5	6.9 (4th)
4- Private cars	9.5	7	9	9	9.5	9.5	8.8 (1st)

### Barriers of Implementation

- Lack of expertise
- Weaknesses of existing procurement legislation that makes difficult the introduction of environmental parameters in the procurement procedure.
- Financial restrictions, as often green products tend to be (in short term at least) more expensive than conventional.

Mechanism for Implementing Green Trading of  
Energy Systems/Services



**Thank you for  
your attention**