



Measures and Policies in Honduras

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Electricity sector review

- **The electricity sector of Honduras experienced a severe financial crisis in the early 1990s, the response to this crisis was the 1994 sector reform, based on a new Electricity Law that established a competitive power market**
- **The competitive market was not implemented because distribution networks were not unbundled and privatized. ENEE (the state-owned vertically integrated utility) is responsible for procuring all energy for meeting demand**
- **The principles of cost-covering tariffs and targeted subsidies have not been implemented due to inadequate political commitment, and high generation prices (due to strong dependency on diesel and HFO) that were not passed on to retail tariffs**



Electricity sector review

- **The single-buyer model has been successful in attracting private investment to expand generation capacity based on long-term PPAs with thermoelectric and small-scale renewable generators**
- **Since 1994, private developers have invested some US\$ 600 million in about 800 MW of medium speed diesel and gas turbine capacity, and some US\$ 70 million in 110 MW of small hydro and bagasse-fired capacity**
- **ENEE is currently facing financial difficulties caused by a) high electricity losses, b) high and volatile international oil prices, c) high costs of long-term PPAs contracted in the 1990s, and d) average retail tariffs covering only about 80 % of efficient supply costs**



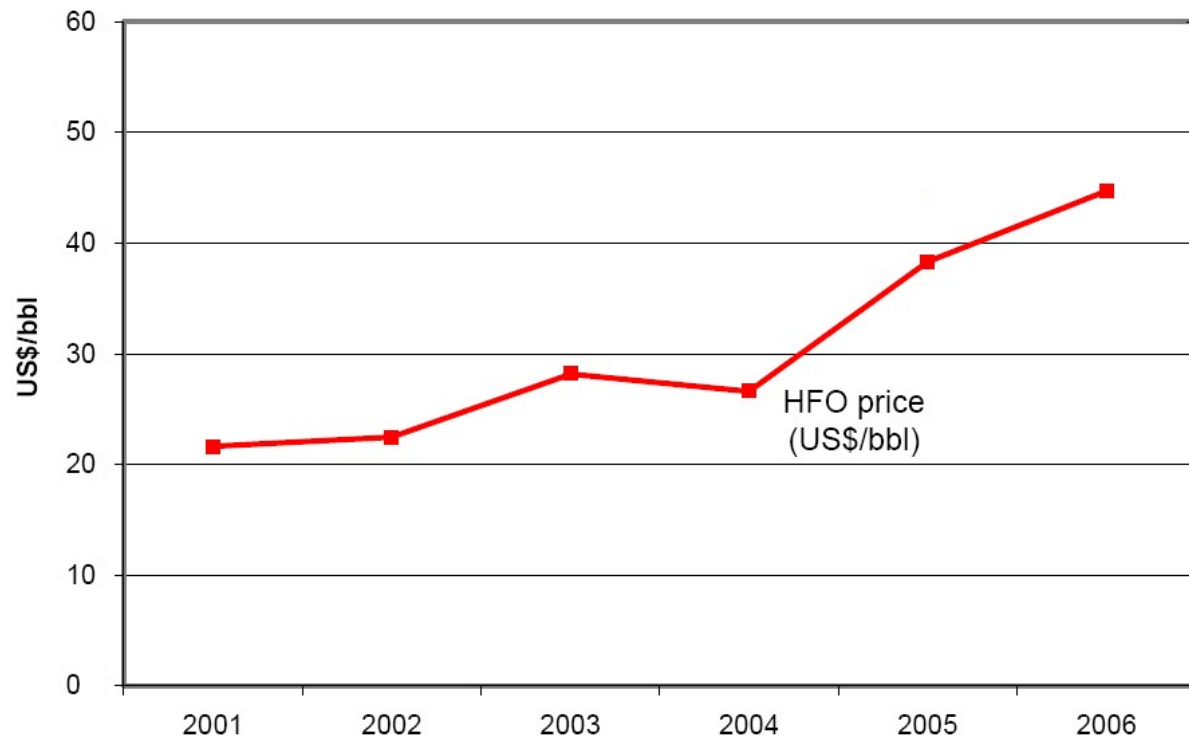
Measures and policies

- **Promoting investment in renewable (small and large-scale) and large coal-fired generation**
- **Revising contracts signed in the 1990s (PPAs and contract for reading, billing and collecting)**
- **Assesing alternatives for new electricity tariffs structure and targetting of subsidies**
- **Implementing a program for reduction of technical and non-technical losses**
- **Promoting a full-scale energy efficiency and electricity saving program**



Investments in generation

- Honduras now depends on imported fuels for about 70% of its power generation
- The cost of energy purchases and fuel expenses doubled from 2001 to 2006, due to a higher share of thermoelectric generation and the steep increase in heavy fuel oil prices

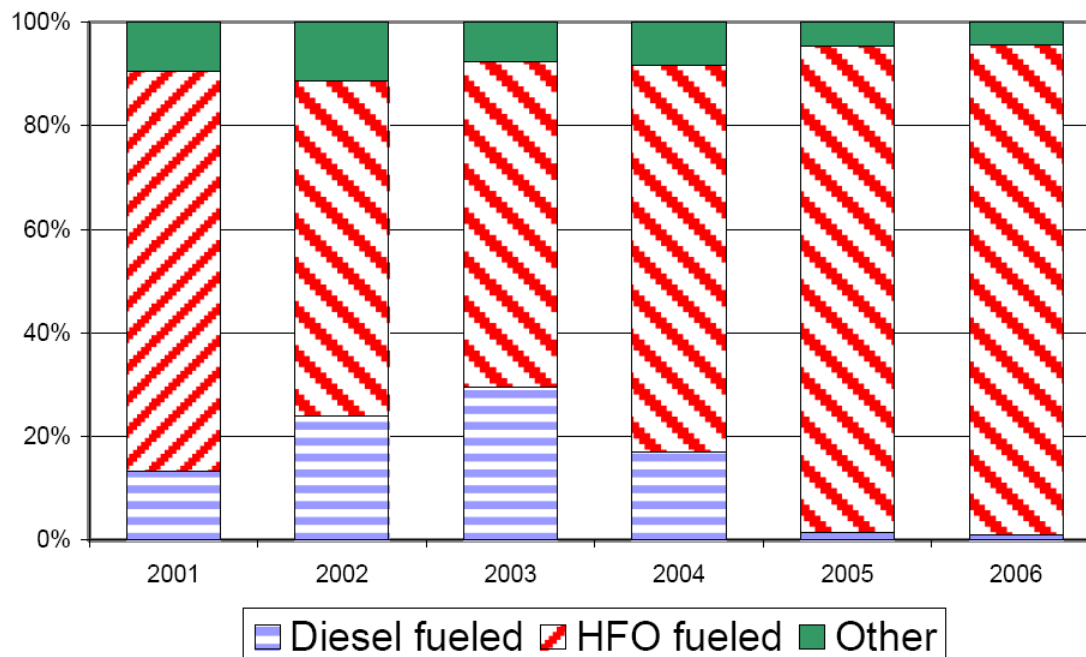




Investments in generation

- **Short-term (2007-2008): restoration of ENEC's HFO plants (60 MW) at Puerto Cortés, and increase of installed capacity of ENERSA HFO plant (28 MW) at Choloma**
- **HFO price is increasing (the average price for May 2007 was 53 US\$/bbl)**

Amount of energy purchases by fuel





Investments in generation

- **Medium and long-term: it is necessary to implement a sustainable energy policy by promoting investment in renewable generation**
- **In October 2006, A MOU was signed by ENEE and Taiwan Power Company, for updating existing studies of Patuca III hydro project (100 MW). A review report and implementation scheme were finished in April 2007**
- **ENEE is promoting other important hydro projects: Jicatuyo (173 MW), Los Llanitos (94 MW), and El Tablón (18 MW)**
- **In 1998, the Honduras Congress approved a legislation to promote the development of renewable energy generating plants (Decrees 85-98 and 267-98)**



Investments in generation

- **This legislation contemplates fiscal incentives and tax breaks to developers, a secure buyer (ENEE), dispatch priority, and a 10% premium for plants with installed capacity less than 50 MW**
- **Under this legislation, private sponsors have negotiated about 30 PPAs with ENEE, 15 of the 16 projects to be added in the next five years are less than 50 MW installed capacity**
- **A new and more general legislation for promoting renewable generation, with increased benefits for developers, has been recently approved by the Congress**
- **Moreover, bilateral talks have been held with El Salvador government for updating studies and defining an strategy for building El Tigre hydro project (357.2 MW / 704 MW)**



Investments in generation

- **Large and economic coal-fired thermal projects can contribute reducing the volatility of generation prices**
- **For the medium-term, ENEE is proposing coal-fired project (up to 600 MW) located at the Puerto Castilla area, in the Caribbean coast**
- **This project includes the construction of major 230 kV transmission lines for meshing the national interconnected system**
- **In 2006, ENEE prepared an expansion plan giving priority to renewable generation, and considering coal-fired plants**

Expansion plan

Northern

Littoral and Eastern

Western

South-Central

Subestacion existente

Subestacion Futura

Generacion Futura

- Hidro
- Biomasa
- Carbon

Generacion Existente

- Hidro
- Térmica
- Biomasa

Líneas 138 kV

- Existente
- Futura

Líneas 230 kV

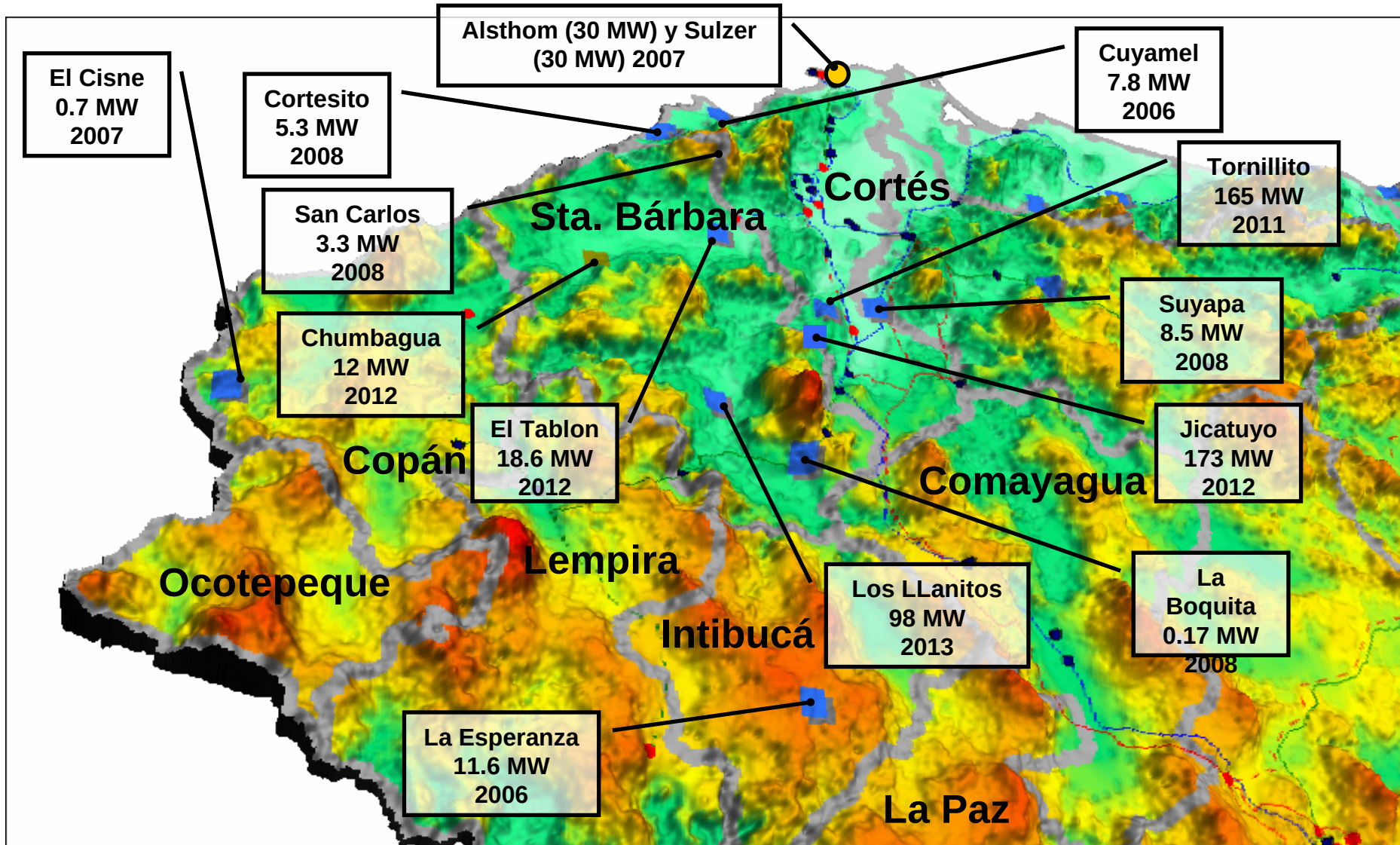
- Existente sencilla
- Futura sencilla
- Existente circuito doble

Líneas 69 kV

- Existente
- Futura

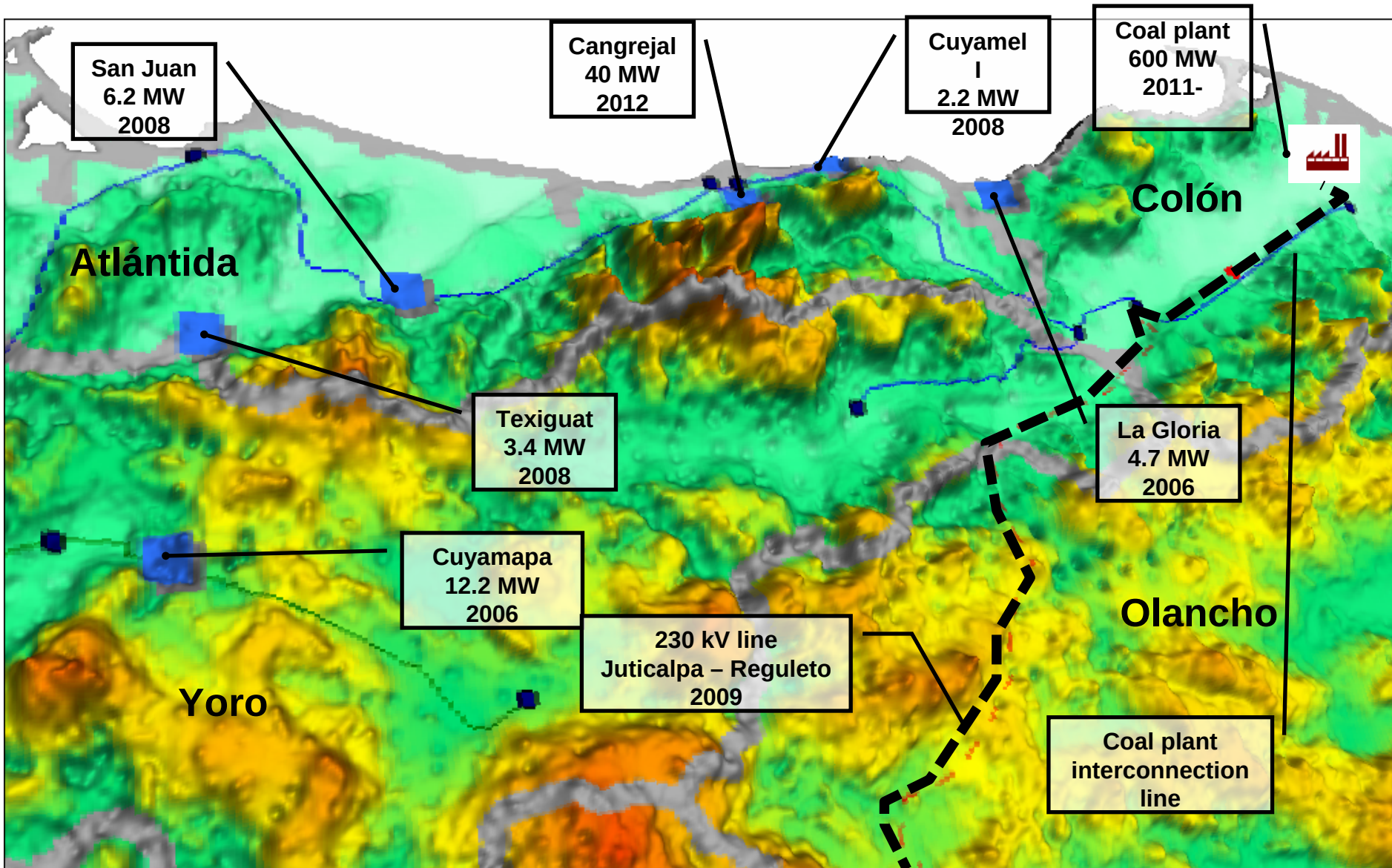


Expansion plan



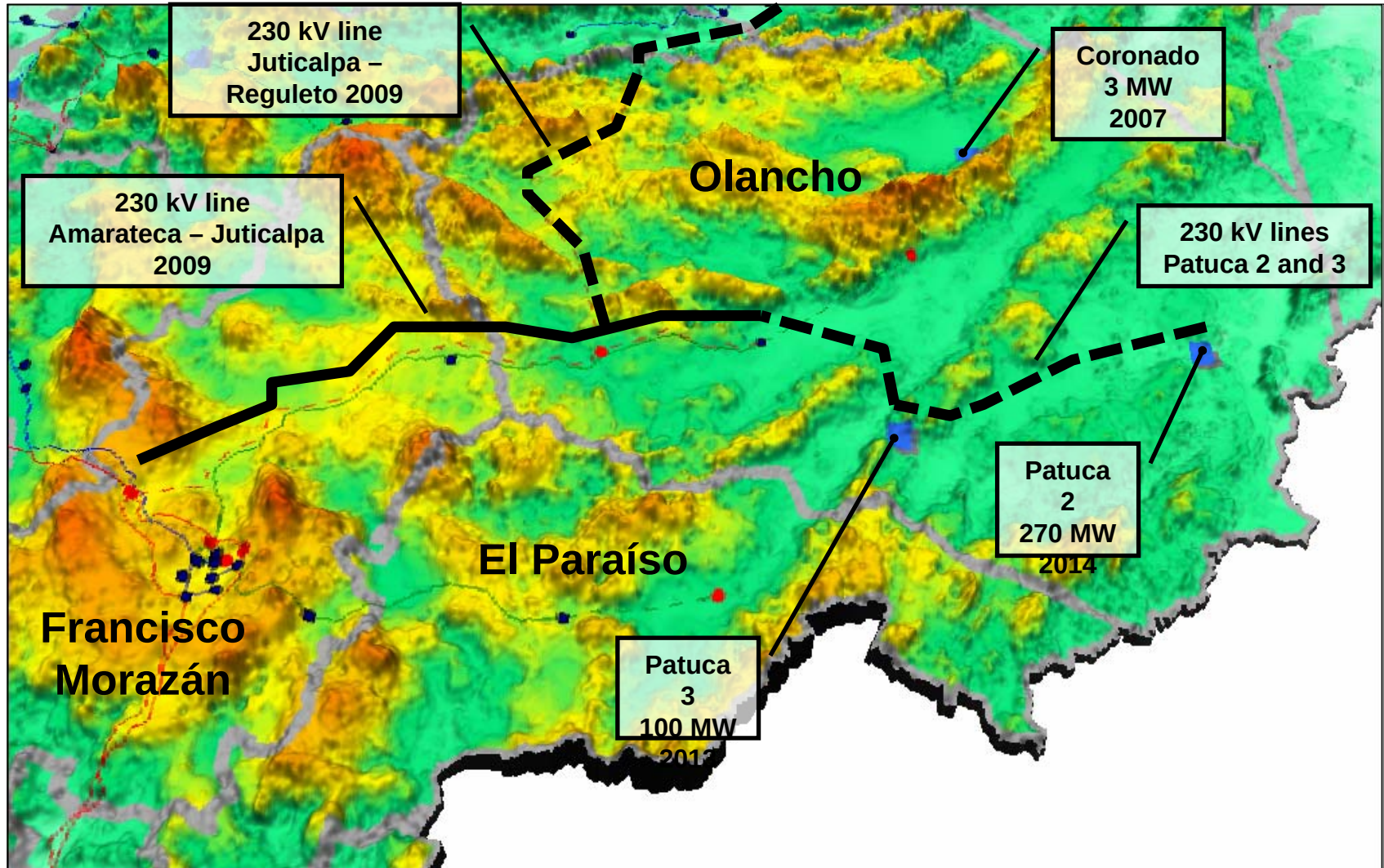


Expansion plan



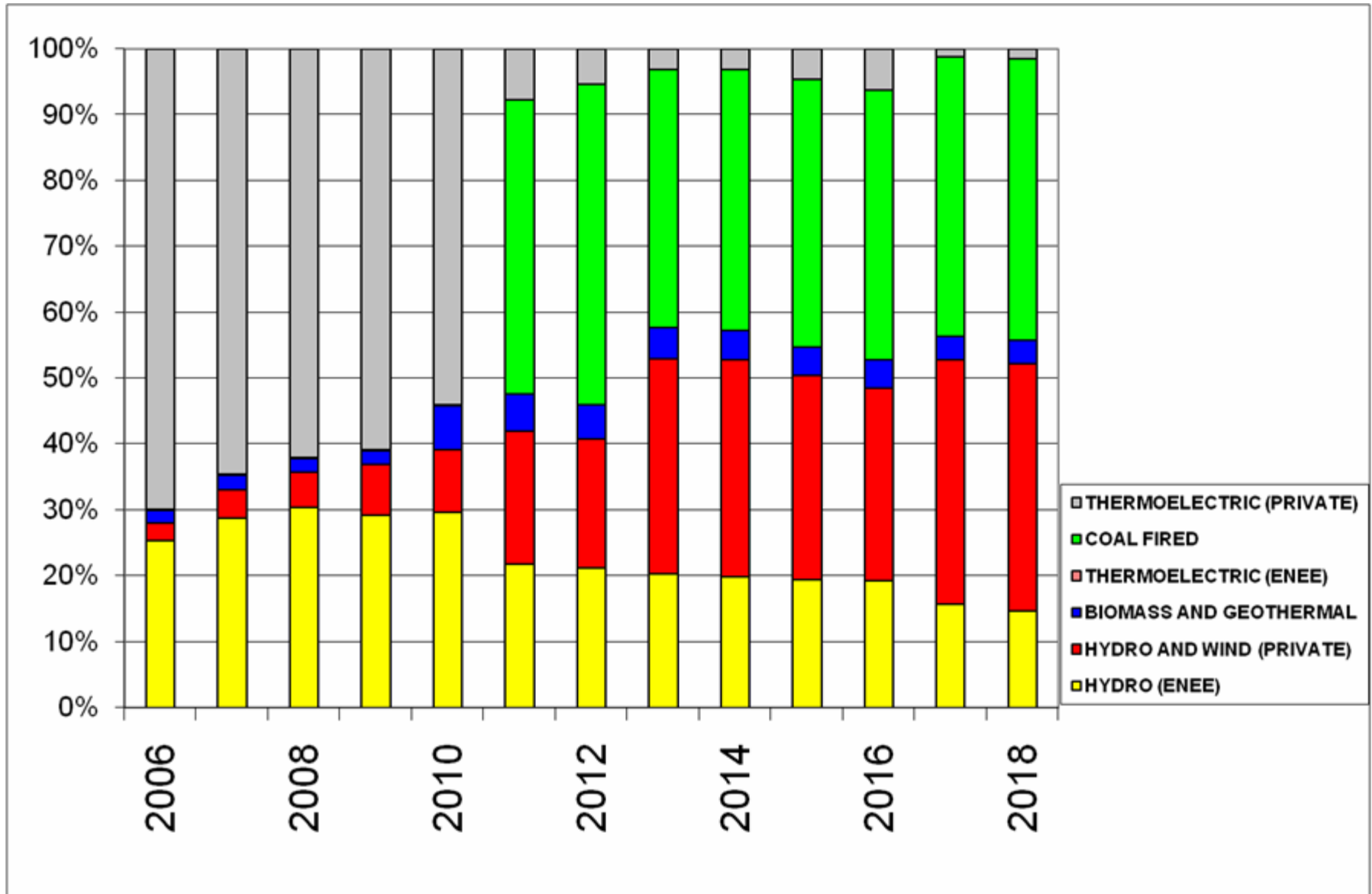


Expansion plan





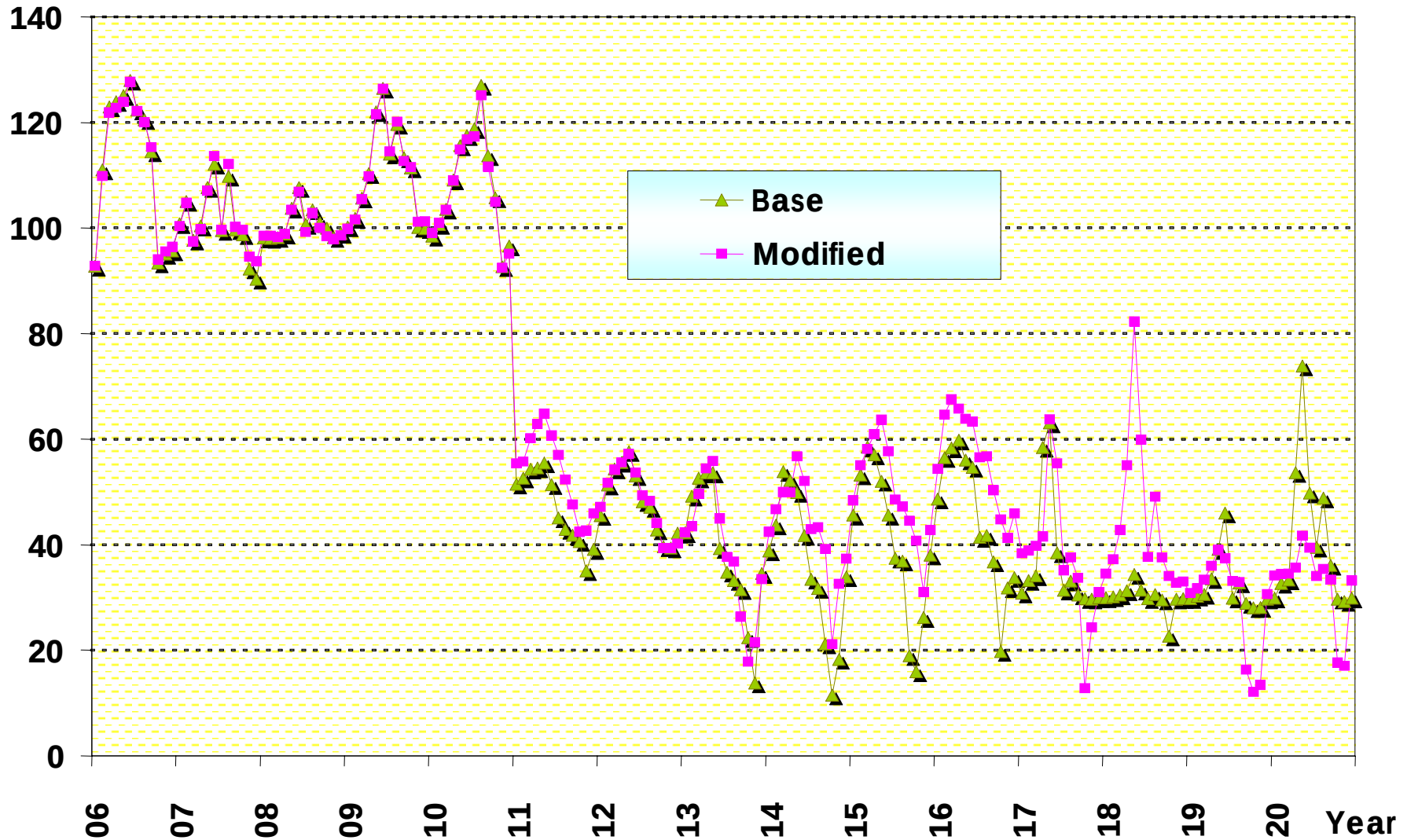
Expansion plan





Expansion plan

Marginal Price
(US\$/MWh)





Contracts revision

- **Annual capacity charges of existing PPAs are about US\$ 110 million (25 % of the cost of energy purchases)**
- **The PPAs are dispatchable contracts, i.e., ENEE pays a fixed charge for the right to capacity, but does not have to purchase any minimum amount of energy**
- **ENEE proposed a revision of long-term PPAs contracted in the 1990s, which reflect high market risks and expensive emergency solutions: LUFUSSA I (40 MW gas turbine) and ELCOSA (80 MW medium-speed diesel plant)**
- **A survey of PPAs prices in Central America, carried out in 2001 by CEPAL, shows that there are two price components for these plants that are clear outliers**



Contracts revision

- **LUFUSSA I capacity charge is 21.3 US\$/kW-month, when a standard value should be about 8 US\$/kW-month. ELCOSA energy charge is 143 US\$/MWh, when a standard value should be 75 US\$/MWh**
- **ENEE's extra cost due to LUFUSSA I's capacity charge is about US\$ 6 million per year. ENEE's extra cost due to ELCOSA's energy charge depends on the economic dispatch. In 2003, the extra cost for ENEE is estimated at about US\$ 14 million**
- **According to ENEE, PPA's revision could represent a cost reduction of about US\$ 20 million per year**
- **SEMEH's contract (reading, billing, and collecting) is also currently under revision, because it is limited in scope and creates weak incentives for performance**



Electricity tariffs

- **ENEE's current tariffs no longer reflect the economic cost of supply, because they are based on cost projections covering 2000-04, and system conditions and cost structure has changed ever since**
- **Currently, the average electricity tariff covers about 81 % of the economic costs of supply**
- **The average tariff for the residential category is about 60 % of the economic cost of supply**
- **Average tariffs for industrial and commercial customers already cover economic costs**
- **The current tariff structure leaves ENEE with a deficit**



Electricity tariffs

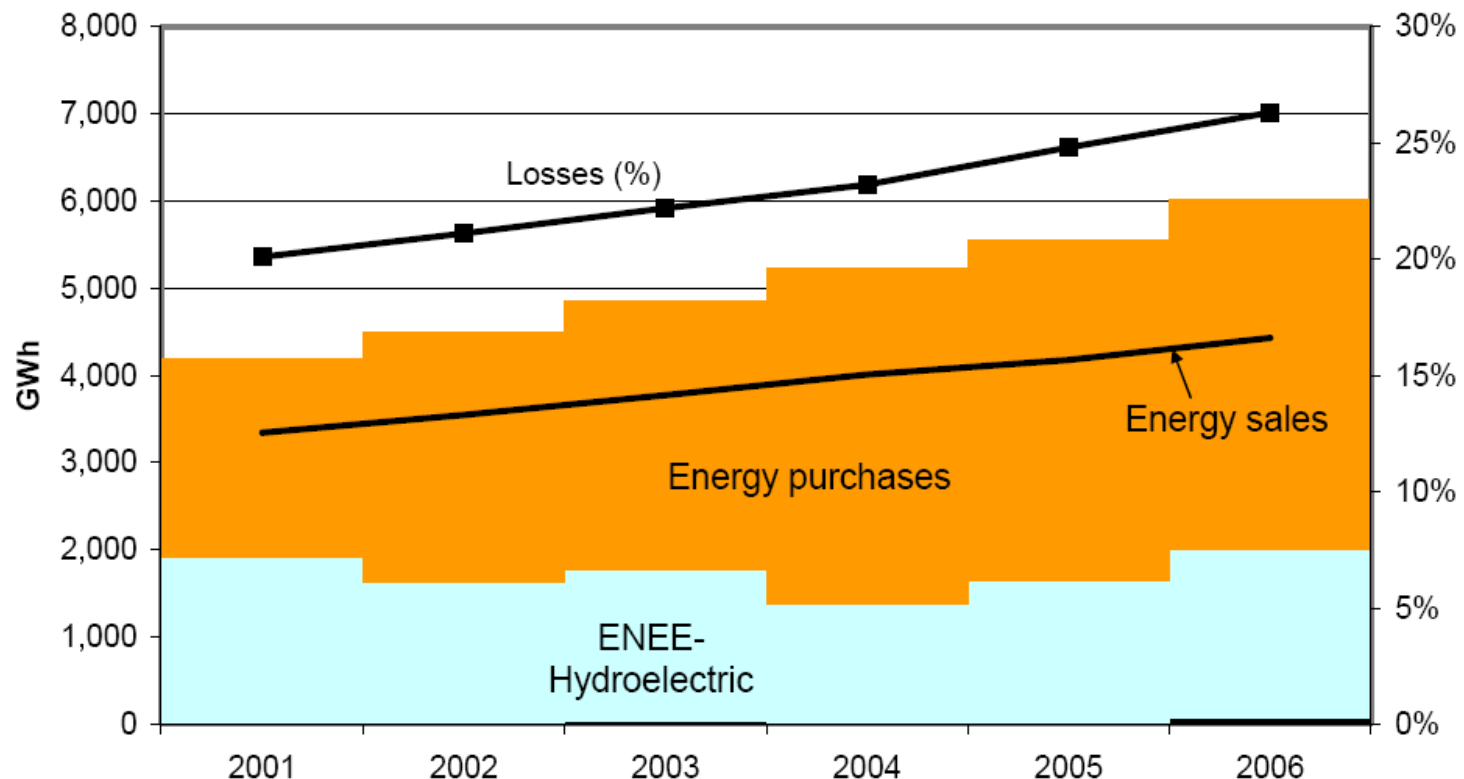
- **There is a generalized cross-subsidy that exceeds the limits established in the Electricity Law, this subsidy benefits poor and non-poor residential customers**
- **Moreover, direct contribution from the government during 2000-2005 is estimated at about US\$ 70 million in direct tariff subsidies for residential customers**
- **Two basic measures for improving ENEE's performance are updating tariffs, and modifying the structure of direct subsidies and cross-subsidies, in order to target them only to poor residential customers**
- **CNE, SERNA, ENEE, CPME and the WB have collaborated in a study for assesing alternatives for a new tariff structure, the study results are currently under discussion and analysis**



Technical and non-technical losses

- **ENEE is currently implementing a loss-reduction program as a key element of a short-term financial recovery**

Honduras
Energy Balance and Losses 2001-2006





Technical and non-technical losses

- **A recent study estimated that technical losses are about 10 % and non-technical losses (commercial) are about 15 %**
- **Non-technical losses are mostly due to fraud (39 %), illegal settlements (29 %), and billing errors (29 %)**
- **To cope with this problem, the loss-reduction program includes a highly publicized service cuts plan, and a US\$ 30 million investment in prepaid meters, tamper-proof connections, and AMR meters**
- **Other important measures that are also included in the expansion plan, are upgrading existing substations and power transformers, and preparing studies for building new transmission lines**



Technical and non-technical losses

- **Moreover, projects for upgrading the National Control Centre, and implementing a pilot DMS for Tegucigalpa and a GIS for Tegucigalpa and San Pedro Sula, are currently under development**
- **These projects include installing 60 substation RTUs, and a new EMS-SCADA system with a regional electricity market (MER) interface**
- **The objectives of these projects are improving the supervision and control of the network, economic dispatch, quality of service, and operative security, as well as providing tools for assessing MER operation and reducing losses**



Energy efficiency

- **The implementation of energy efficiency measures on the demand side could effectively reduce short-term need for generation**
- **Recently, the Inter-Institutional Group for Efficient Use of Energy (GIURE) was established with the participation of the government (SERNA, CNE, ENEE, GAUREE), private sector (COHEP, CEHDES/PESIC), academia (UNAH), and professional associations (CIMEQH)**
- **GIURE has set out a plan to reduce national electricity demand by 100 MW in 2008, equivalent to an 8% reduction of the total demand forecasted by ENEE**



Energy efficiency

Activities	Entity Responsible
Program of energy-efficient bulb replacement	GAUREE/ENEE/SERNA/UNAH
Promotion of gas stove use	COHEP/SERNA
Rationalization of subsidies and tariffs	ENEE/SERNA/CNE
Use of clean development mechanisms	SERNA/ENEE
Educational campaign	GAUREE/ENEE-SERNA
Efficiency in the industrial and commercial sectors	PESIC
Mass communication campaign	COHEP
Create a Foundation	COHEP/PESIC



Energy efficiency

- **GIURE is also working in an strategic partnership with the Ministry of Education to implement the “Energy guardians” program to help children become drivers of change at home**
- **This strategic partnership also seeks the inclusion of Energy Efficiency in the school curriculum**
- **Moreover, a draft law for energy efficiency and electricity saving has been prepared by SERNA**
- **This draft law includes, among other measures, creating a national agency for energy efficiency and electricity saving, similar to Mexico’s FIDE**



Energy efficiency



IMAGINAS TU VIDA **SIN ENERGIA ELECTRICA**

¿QUE PASARÍA SI NO TUVIERAS CON QUE ALUMBRAR TU TRABAJO O TU CASA?

A pesar de que tenemos un consumo energético muy superior a lo que pagamos por el servicio nos enfrentamos a una crisis de abastecimiento porque estamos desperdiciando la electricidad, no le damos su verdadero valor.





Energy efficiency



¿IMAGINAS TU VIDA SIN ENERGIA ELECTRICA?

Actualmente hay más de 2 millones de hondureños que viven atrapados en el subdesarrollo por falta de energía, con la crisis energética que se avecina esto podría suceder en todo el país.





Energy efficiency

CADA VEZ QUE **AHORRAS ENERGIA...**



...COLABORAS CON EL PROGRESO **DE HONDURAS.**

Si ahorras energía más hondureños podrán recibir educación en mejores condiciones.
Todos los hondureños debemos actuar juntos y contribuir a resolver el problema.





Summary

- **Honduras power sector expansion is moving from a HFO based generation to small and large scale renewables, and coal-fired generation**
- **Two basic measures for improving ENEE's performance are updating tariffs, and modifying subsidies structure**
- **ENEE is undertaking a loss reduction program and revising contracts for improving is overall performance and reducing energy purchase prices**
- **In the short-term, it is necessary to support energy efficiency and electricity saving programs in order to reduce electricity demand, and defer emergency generation leasing**