



# Thai Cogeneration Policy Experiences

## 2004 Cogeneration Day in Lao PDR

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# Power Purchase from Small Power Producer (SPP) Program

- Program introduced in 1992
- Objectives:
  - private-sector participation in power generation
  - promotion of use of indigenous and renewable energy resources
  - promotion of more efficient use of energy
  - reduction of government's investment burden



## SPP Program

- **SPP = Cogeneration or Renewables**
  - **Cogeneration SPP:**
    - **Fossil-fuel-based SPPs**
    - **Steam utilization rate >10%**
    - **SPPs using more than 25% gas/oil as fuel :  
Efficiency >45%**
  - **Renewable SPP: May use up to 25% commercial energy**
- **Sale into EGAT's transmission system no greater than 60 MW (90 MW on a case by case basis)**
- **Direct sale to industrial estates near SPPs**



# SPP Regulation

- **Firm Contract:**
  - SPP must guarantee electricity supply during the system peak months and total production hours of no less than 7,008 per year for fossil-based SPPs or 4,672 per year for renewable SPPs
  - Monthly capacity factor  $> 0.51$
  - Energy and capacity payments based on LR Avoided Cost of EGAT
  - Contract length: 5 - 25 years
- **Non-Firm Contract:**
  - No guarantee of electricity supply
  - Energy payments based on SR Avoided Costs, no capacity payment
  - Contract length: one year but renewed automatically



# Issues in the Implementation of the SPP Program (1)

- **The 1997 economic crisis affected SPP projects' viability and hence the following changes were made to help SPPs:**
  - **Foreign Exchange Partial Indexation: Purchase price of electricity raised by partially indexing capacity payment to US dollars**



## Issues in the Implementation of the SPP Program (2)

- **Relaxation of Definition of Cogeneration: As some direct customers of SPPs could not buy as much electricity as planned, SPPs were allowed to**
  - 1) generate electricity on an open cycle (using only gas turbines) for 1 year**
  - 2) have steam utilization rate of <10% and lower CHP efficiency of <45% for 3 years or till the end of 2003**



## Issues in Implementation of the SPP Program (3)

- **Energy payment for non-firm renewable SPPs, initially indexed to oil prices, soared as oil prices increased. To solve this and better reflect EGAT's actual avoided cost, the formula is modified to index to gas prices instead.**



## Issues in Implementation of the SPP Program (4)

- **Purchase of power from new projects of cogeneration SPPs since 1997 has been terminated because**
  - power demand declined during the financial crisis and hence excess reserve margin of the country's total generation capacity
  - bidding may be introduced in the future for power purchase from cogeneration SPPs, as made for IPPs
- **Purchase of power from Renewable SPPs is however continued because of the government policy of promoting the development and applications of renewable energy**



## SPPs (as of Jan 04)

Type of SPPs	Exported to the grid	
	No.	MW
<b>1. Cogeneration SPPs</b>		
Natural Gas	19	1,413
Fuel Oil	1	9
Coal	4	196
Non-Conventional Fuels+Coal	3	190
Waste Gas	1	45
<b>2. Renewable SPPs</b>		
Non-Conventional Fuels (bagasse, rice husk, wood waste)	33	276
<b>Total</b>	<b>61</b>	<b>2,129</b>



# Power Purchase from Very Small Renewable Energy Power Producer Program : VSPP (1)

- **Introduced in May 2002, to further support the efficient use of renewable energy for electricity generation by small-scale generators**
- **VSPP = electricity producers with < 1 MW output using renewables, waste, residues or by-product steam to generate electricity.**
- **VSPP can also be cogeneration VSPP using renewables such as biogas from pig farms or food factories, and rice husk**



# Power Purchase from Very Small Renewable Energy Power Producers Program : VSPP (2)

- **The program allow for streamlined interconnection and approval process as well as cost reduction for interconnection**
- **Generation that is below or equal to consumption is credited at : full retail rates (both normal rates and TOU rates) + Ft retail**
- **Generation that is above consumption is credited at : wholesale rates + Ft wholesale**
- **VSPP with net generation can generate income by selling excess electricity to the distribution utilities**



## VSPPs (as of Mar 04)

Type of VSPP	Number of Submitted Requests	Maximum Capacity (kW)
PV Rooftop Systems	37	105.4 (15.4*)
Landfill Gas	2	1,700
Wood Waste	1	90*
Palm residues	1	800
Biogas	5	600
Rice husk	2	2,000 (1,000*)
<b>Total</b>	<b>48</b>	<b>5,070.4</b>

\* = already started selling electricity to the grid



## Renewable Energy: Thailand is aiming for...

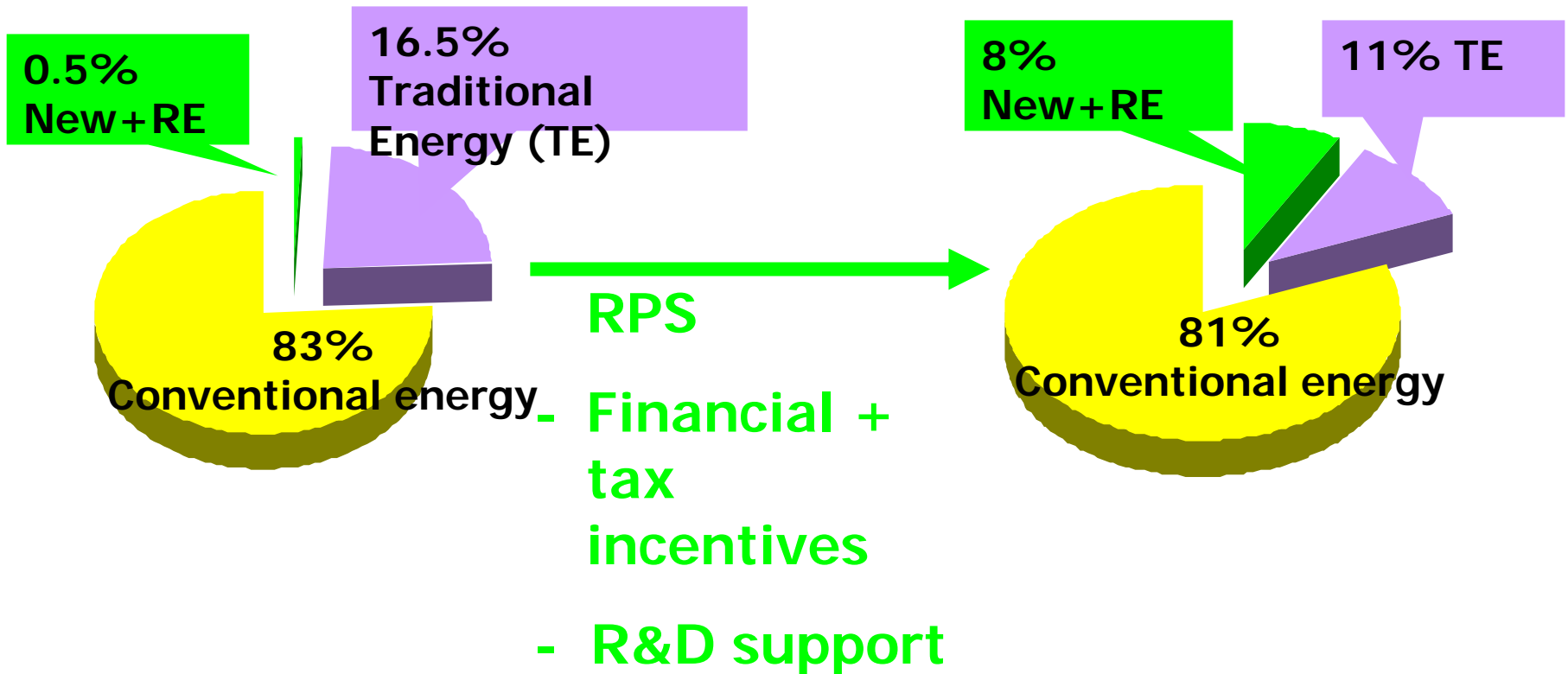
- Renewable Energy Target: **from 0.5% today to 8% within next 10 years** (RPS, cabinet resolution of 2 March 2004)
- RE Electricity Target: **from 560 MWe in 2002 to 2,400 MWe by 2011** (EPPO)
- New fossil-fueled power plant to supply RE electricity at 5% of its capacity (RPS)

What is the implication for Thai Power Sector?

- ✓ **2,400 – 560 = Additional 1,840 MWe is needed by 2011**



# National Renewable Energy Strategy





## Policy Direction for Cogeneration SPPs

- **Promotion of efficient utilization of heat/steam and power**
  - zoning: encourage CHP power plants and large heat consumers to locate in industrial estates
  - more flexible power purchase regulations: i.e. excess steam could be used for power generation and sold to the grid for non-firm price
- **Promotion of cogeneration SPPs at sites such as airports (i.e Suwannabhumi Airport), shopping centers, industrial complex which are located near gas pipeline**



## Policy Mechanisms for Cogeneration SPPs

- Financial incentives such as soft loan or support for 0% interest rate as well as tax incentives will be used
- Renewable Portfolio Standard (RPS) as a market-driven mechanism will be imposed on new fossil power plants to supply electricity from renewables at 4% of the generation capacity of the plants
- Thus, bidding will be introduced for purchase of electricity generated by both fossil fuels and renewable energy in order to encourage efficient power production as well as development of power generation using renewables



# Policy Direction

## for Renewables and Cogeneration Technologies

**RPS, power purchase from renewable SPP, VSPP**

**Public awareness and info dissemination of the benefits of RE+cogeneration technologies**

**Increased demand, competition**

**Increased support/use**

**High-efficiency heat and power production and utilization and increased competitiveness of the country**

**Increased local production/supply capability, efficiency improvement and cost reduction**

**Government and private partnerships and support**



# Conclusions

- **Cogeneration technologies contribute to efficient use of heat and power and hence efficient development in both power plants and industries**
- **Cogeneration technologies are environmental-friendly**
- **Cogeneration technologies make the cost of power generation less dependent on the economy of scale of power plants and thus enable small, efficient distributed generators economically viable in various areas, helping to reduce distribution loss.**



For more information,  
please visit COGEN 3 Website at:

<http://www.cogen3.net>

**Thank You !**