

Hannover, Branchen- und Export Forum Erneuerbare Energien

Biogas in Thailand

Booming market and challenges to be addressed

Hannover Messe

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Outline

- Sources
- Investment Costs
- GTZ Biogas Project
- Thailand Renewable Energy Development Plan
- Biogas Production Projects
- Supporting schemes and incentives

Sources



Industrial wastewater

- Tapioca/Palm Oil/Ethanol
- Food canning and process
- Frozen Seafood








Agriculture wastewater

- Pig/Chicken/Duck/Cow



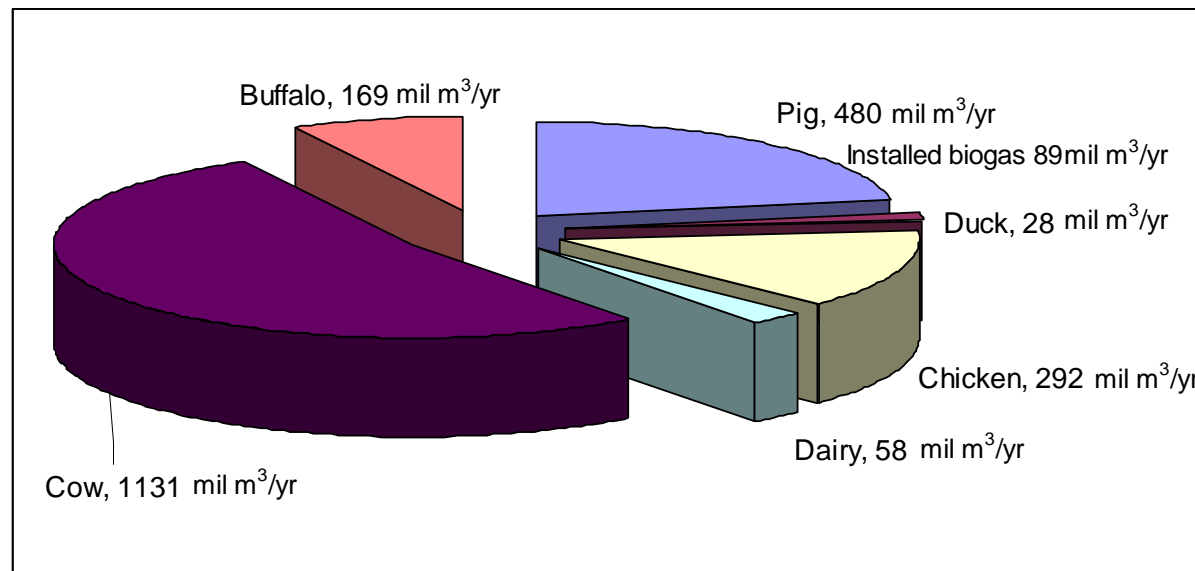
Municipal Solid Waste (MSW)

Industrial Wastewater

Industry		Total factories	Biogas systems	No Biogas
1. Starch/Tapioca		86	60	26
2. Palm oil		49	22	27
3. Ethanol		24	11	13
4. Rubber		88	4	84
5. Food processing		66	26	50

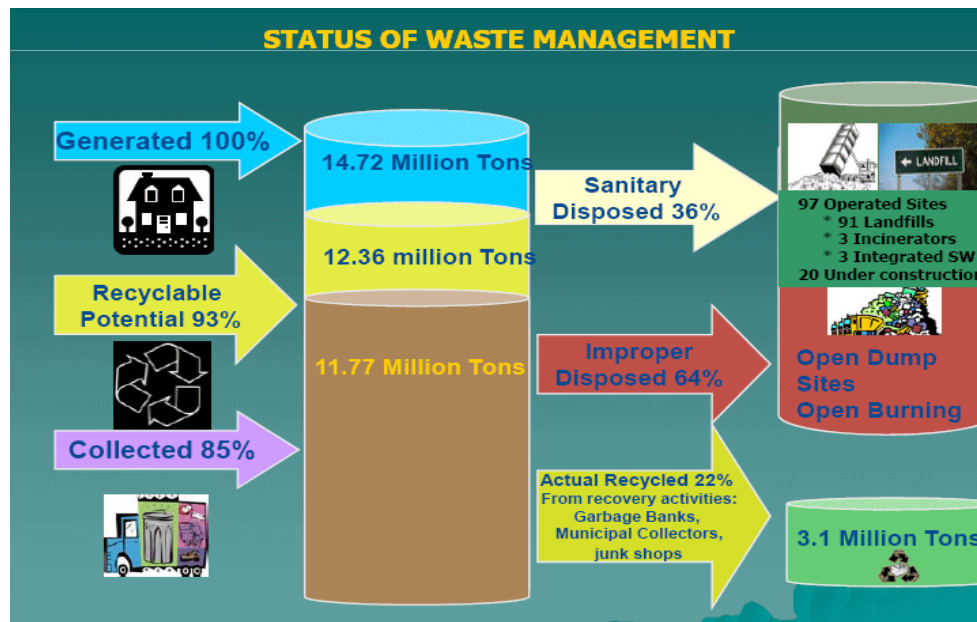
Agricultural Wastewater

- Pig farm is most developed in biogas installation with 20% of potential.
- With government subsidy target, pig farms will reach 40% of potential in 2013
- Other farms still behind in biogas development due to technical, financial barriers, collection of sources, and competing use in other sectors



MSW and Domestic Wastewater

MSW	No.	Biogas Potential (mil m3/year)	Biogas in operation		Remaining Potential	
			No.	(mil m3/year)	No.	(mil m3/year)
Municipality and Sub-district	7,948	1,218	2	3.5	7,946	1,215



- Good potential for CDM projects
- Many landfill biogas projects are now being developed

Investment Costs

Waste sources	Baht/m ³ biogas	Baht/kWh
Dried fruit	0.33	0.28
Tapioca	0.77	0.64
Palm Oil	0.84	0.70
Pig farm	0.96	0.80
Starch	1.37	1.14
Slaughter (pig)	2.65	2.21
Paper	3.11	2.60
Alcoholic beverage	3.52	2.93
Beer	5.12	4.26
Solid Waste	5.44	4.53
Non-alcoholic beverage	7.19	5.99

Cost of biogas systems depends on several factors. The above table shown average investment cost regardless of technology from field survey, interview, and secondary data from 190 systems in Thailand.

- Only Initial Investment Cost
- System life time 15 years
- Overall biogas production



Source: A Study on Biogas Potential, KMUTT, 2006

GTZ Biogas Project

Problems/barriers in Thai Biogas sector

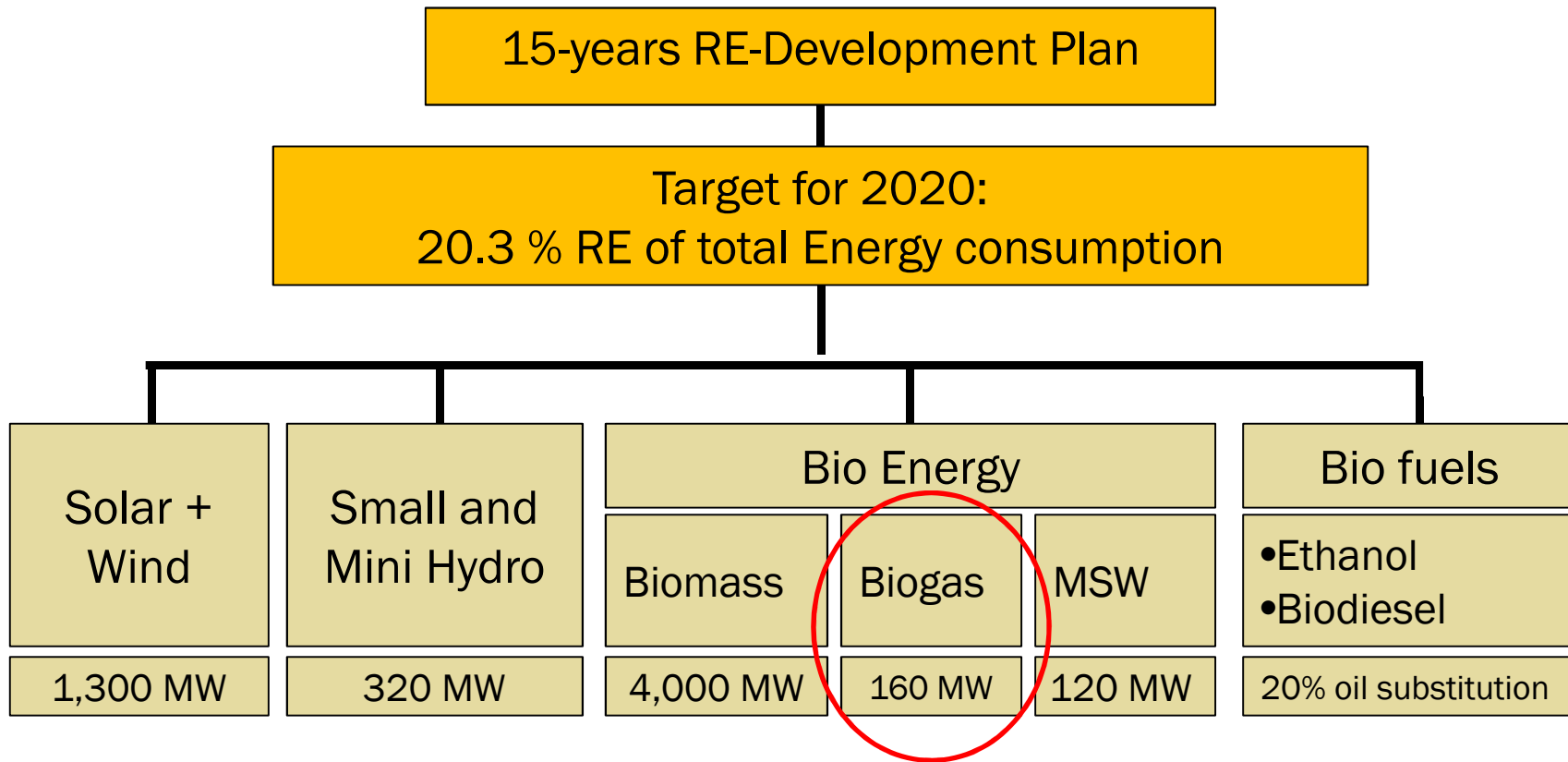
- Human resource: under qualified operators leads to inefficient operation of systems/shut down
- Lack of mutual agreement on standards
- Lack of network for cooperation among several stakeholders

GTZ Biogas Project

- Identify incentives/measures for impenetrable sub-sectors
- Quality system for operator/planner and human resource development
- Biogas network/association

Project period: 2 years (October 2009 – September 2011)

Thailand Renewable Energy Development Plan



Source: Ministry of Energy; Thailand National Energy Policy and Strategies

Biogas Production Projects

	Projects	Investment Support (Mil Baht)	Biogas (Mil m ³ /a)	Energy Saving (Mil Baht/yr)
Target	1,783	3,769	762	5,400
Operating Results 2008-2009	507	926.6	393.7	2,697
Livestock and Related	441	408.8	78.7	516.9
Industry	49	498.7	314.5	2,175.0
Food waste	17	19.1	0.35	2.9

Data of Jan. 2010



Source: Ministry of Energy; Update & Progress on Thailand 15 Years Renewable Energy Development Plan (REDP)

Supporting schemes and incentives

Tax Incentives (Board of Investment - BoI)

- 8 year income tax holiday
- plus extra 5 year (9th – 13th) 50% tax reduction
- Exemption of import duty on machinery
- Land ownership rights for foreign investors
- Permission to bring in foreign experts and technicians to work for the projects
- Long-term visa for foreign investors



Supporting schemes and incentives

Funded by EnCon Fund

Feed-in Premiums – “Adder” on top of regular tariffs

Biogas (all categories of production sources)	Adder (B/kWh)	Special Adder * (B/kWh)	Supporting period
Installed capacity ≤ 1MW	0.50	1.00	7
Installed capacity > 1MW	0.30	1.00	7

* Special adder for 3 provinces in the south of Thailand

Investment grants

10 – 30 % grants for design, consultant and partial investment



Source: Ministry of Energy; Thailand National Energy Policy and Strategies

Supporting schemes and incentives

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Technical Assistance

Maps, Tech Catalog, 1-Stop Service

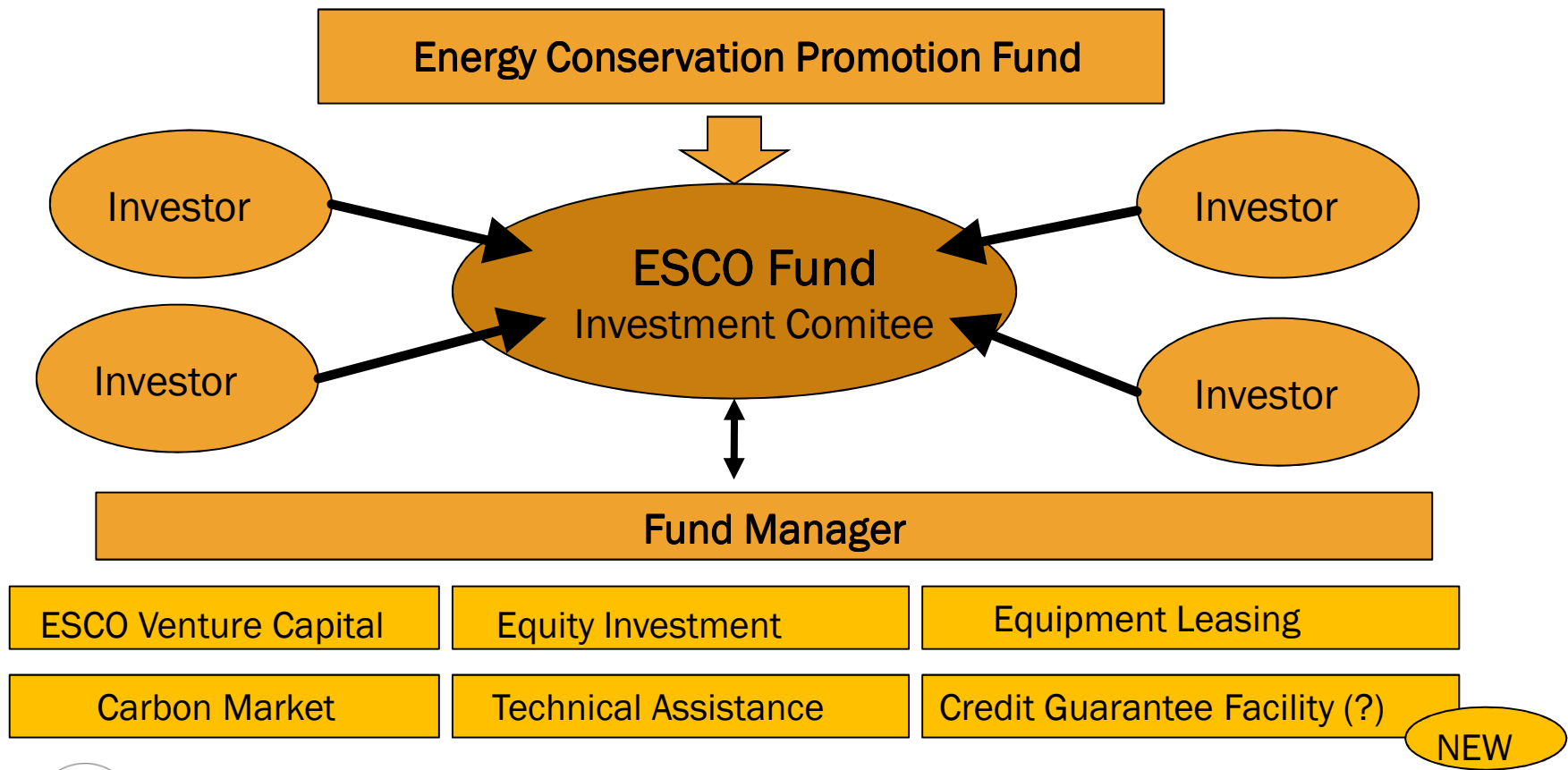
Soft Loans

2-Stepped Loan, Max. Fix 4% , 7 yr. loan period

Gov Co-Investing Scheme ESCO Fund



ESCO Fund Scheme



Source: Ministry of Energy; Update & Progress on Thailand 15 Years Renewable Energy Development Plan

ESCO Fund Scheme

- **ESCO Venture Capital**
 - Joint Venture at 10-30% of total investment, Less than 50 MB, Within 3-7 years
- **Equity Investment**
 - Project Investment, 10-50% of total investment, Less than 50 MB, 3-7 years
- **Equipment Leasing**
 - Equipment Leasing, Less than 10 MB, Within 5 years
- **Technical Assistance**
 - Technical Support on Project Design, Planning, & Implementation
- **Carbon Market**
 - Able to joint invest on CDM projects



Revolving Fund scheme

Conditions

Period Lending	Not over 7 years
Who	Factory/Building, Energy Management Company(ESCO)
Project Type	Renewable and Efficiency energy project in Compliance with ENCON Act B.E. 2535 Article 7 and 17
Budget	50 MB./Project
Interest Rate	4 %



Thank you very much for your kind attention!

GTZ

German Technical Cooperation

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