Renewable Energy for rural area- Low Cost Biogas Technology in Vietnam

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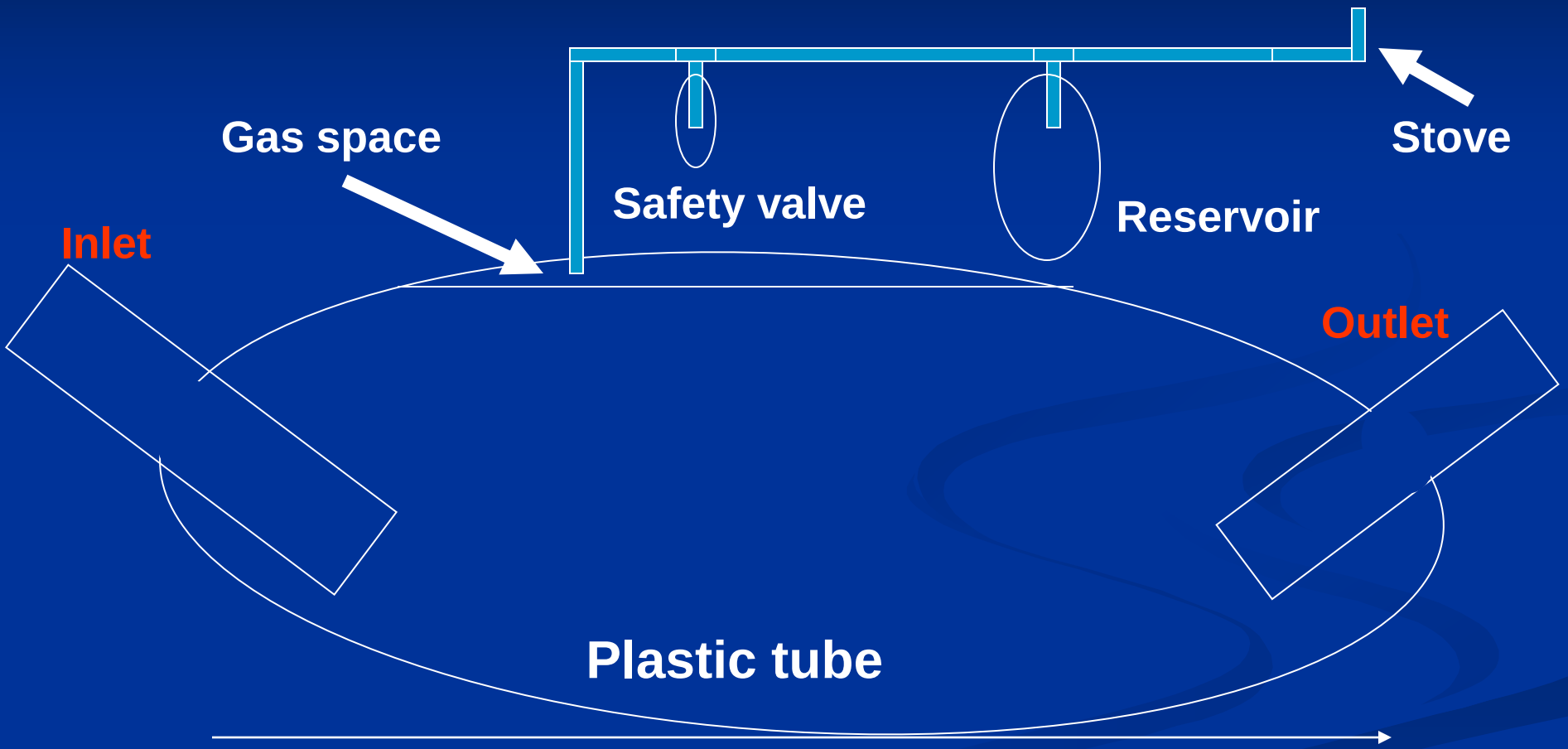
INTRODUCTION

- Biogas Technology developed for 30 years in Vietnam
- Concrete and plastic models
- 100.000 low cost plastic units installed in Vietnam
- Yet in the South, not in the North

CONCRETE BIODIGESTERS IN VIETNAM

- Initial Fast Development
  - High demands for energy sources
  - Support: 30-75% subsidy (attractive money!!!)
  - Low utilization rate (90% units out of work after 10 years HCM City)
- Problems
  - High investment: 3-20 year payback
  - High technology
  - Post-installing services

Plastic bio-digester components



PLASTIC DIGESTER TECHNOLOGY

- **Advantages**
  - Local materials- low cost
  - Local knowledge- simple way
  - Easy to repair
- **Weakness**
  - Easy to break
- **Application?**
  - Technology - Environment - Methodology

List of materials

- **Digestor**
  - **Plastic tupe**
  - **2 ceramic tubes of 50cm**
  - **Accessories in PVC**
  - **Old inner-tubes**
- **Safety valve**
  - **Water bottle**
  - **3 stakes**
- **Stove**
  - **Galvanized pipes**

Preparing the two films of plastic (one inside the other)

Digging the trench

Fix the inlet and outlet

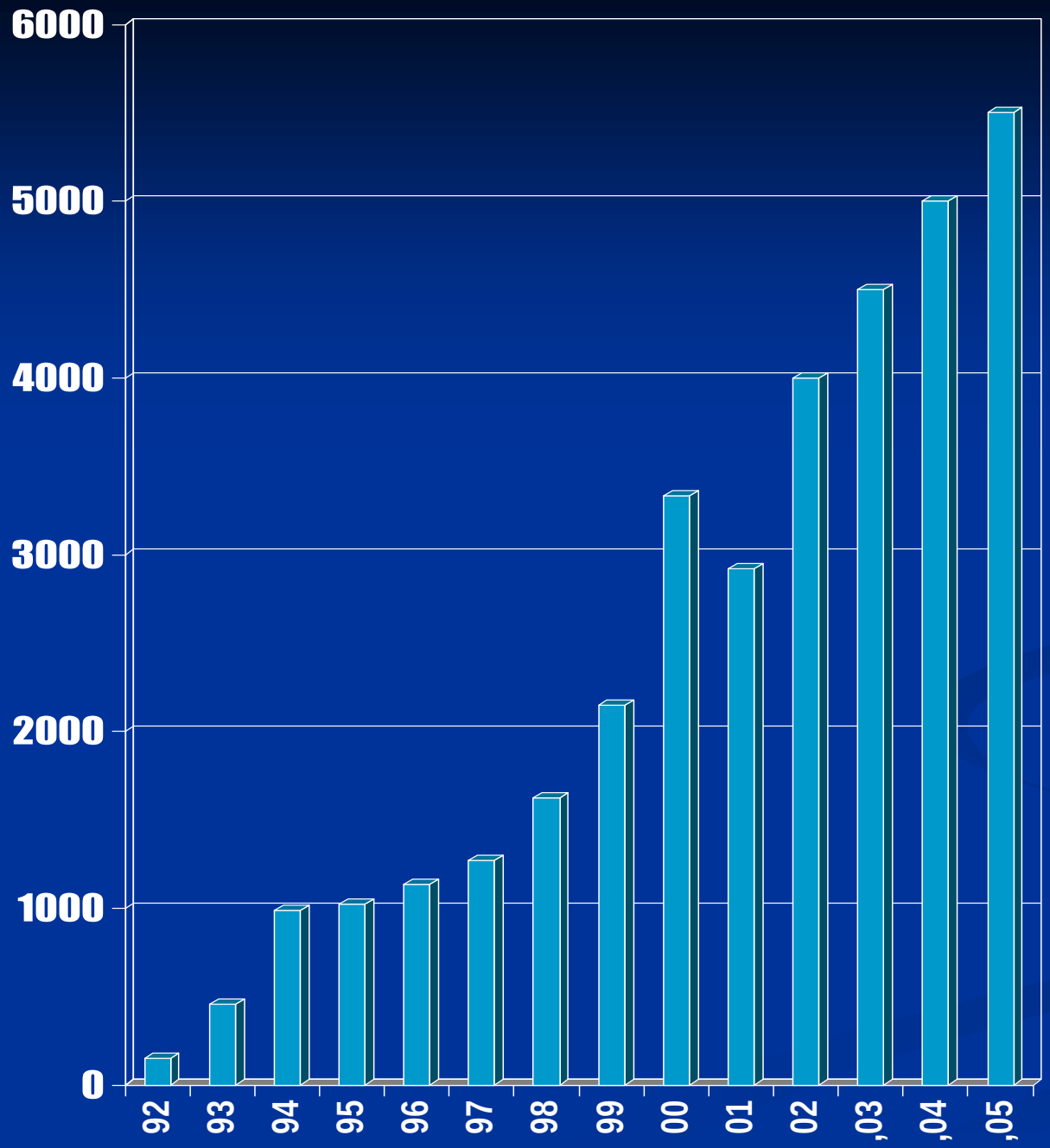
Put the digester into the trench

The gas outlet pipe and safety valve

The Reservour in kitchen

Simple Stove

Cast-iron Stove



Biogas units developed by Thu Duc Group in 14 years

Nong Lam Univ.2005

Problems related to the introduction and use of plastic digesters (North and South)

1. Farmers took less attention for the plastic digester in the region where fuel wood is still easy to find and collect
2. Investment still a serious problem for the poor
3. Technicians live in urban areas, not enough time to visit digester everyday. When the digester was kept without functioning within a period farmers were gradually dropped their interest
4. Plastic material was not available in the areas, it had to be imported from the city
5. There was not a real practical integration of the system.
6. There is a taboos and social bias related to the use of the slurry containing animal or human manure

Factors determining the success of the introduction of Biodigesters

- **Socio-economical factors**
  - Macro-economic relations: international prices on oil and coal, trade patterns, trade regulations.
  - Micro-economic factors: local price of energy sources, economical & social development state, farmers wealth
  - Type of farm production: kind of animals, horticulture or agriculture
  - Relative costs of the digesters, cost payback time

- **Technical / biological factors**
  - Climate, Water and Land Resources
  - Access to and prices of other energy resources
  - Technology: Available? Simple?

Floating plastic Biodigester

Factors determining the success of the introduction of Biodigesters

- **Institutional and Organizational factors**
  - Governmental policy: agricultural & environmental promotion
  - Implementing organization: GO or NGO, objectives
  - Extension methodology: top-down or bottom-up, existing extension institutions, demonstration farms
  - The fieldworkers: Extensionists, people from implementing organizations. (Who are they?, How are they trained?, How often visit the farms? Are they paid? Are they convinced?)

Factors determining the success of the introduction of Biodigesters

- **Institutional and Organizational factors (continued)**
  - Farmers: Level of participation from farmers
  - Relations between different levels in the organization
  - Financing: digesters donated, partly donated or farmers pay themselves
  - Access to materials: Where can buy materials
  - Access to technical assistance
  - Mental Education

INTRODUCTION METHODOLOGY

- Select real farmer who needs biogas
- Active participation: Farmer knows, farmer pays and farmer takes care
- Direct work with farmer dealing with feedback and converting that into researchable problems

Farmers protect digester by local material

PROSPECT OF BIOGAS USE

- **Situation**
  - Small scale / big scale
  - Subsidy / shelf-sufficient
- **Constrains**
  - Investment: high and long
  - Management: centralized / decentralized
  - Technology: monotonous / diversified
  - Social and cultural political
  - Information Dissemination and commercialization

Biodigesters in the farming system

- Biodigesters as an essential component of farming system - not simply a means of producing combustible gas from waste materials
- Biodigesters produce efluente, nutrient source for many crops
- Means of recycling process
- A means of de-contaminating wastes rich in organic matter

Irrigation

Feed

Excreta

Biogas

Effluent

Manure

Integrated farm

FOLLOW-UP ACTION

- **Policy**
  - Subsidy or shelf-sufficient: Fair play
  - Styles: monotonous or diversified
  - Useful life: long not means sustainable
- **Extension & Development**
  - Supply of credit
  - Provision of technical backstopping
  - Digesters on farming systems
- **Organization**
  - Intranet: Who- head, members, How- time, money
  - Internet:

CONCLUSIONS

- The low-cost polyethylene tubular technology has been resolving constraints of high investment for construction and difficult procedure and repair
- The dissemination requires farmers' motivation.
- In order to promote the farmers' participation, it is necessary to select real farmers as demonstrators, create appropriate credit systems for the poor and strengthen the farmer-extension-scientist relations.
- Research based on farmer participation is proposed as the model for further activities

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THANK YOU