Medium Sized Biogas Plants: Pakistani Experiences and Regional Prospects

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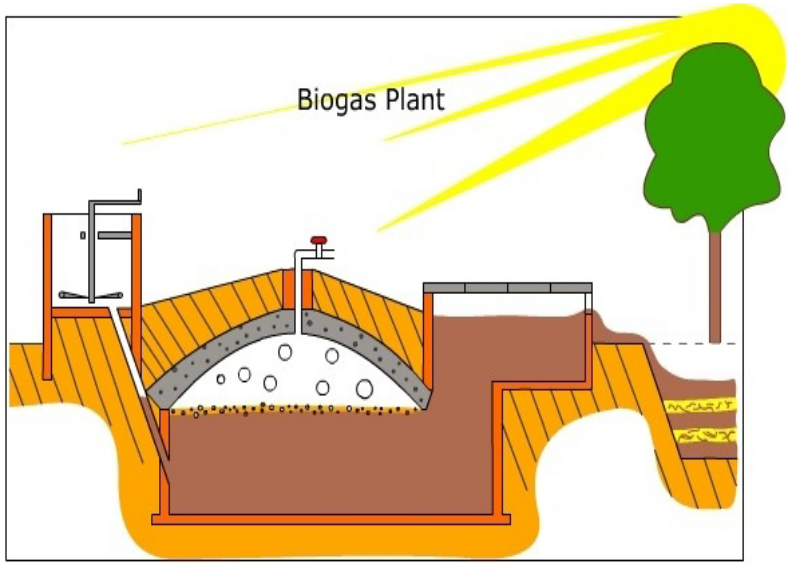
Biogas Technology Market

Medium Sized Biogas Plants: A solution for Energy Security



Pakistan: Background

- 40,000 farms with more than 50 animals
- Dairy farms face serious power shortages – use diesel for electricity generation

Commercial Biogas Project (pilot): Funded by USEPA

- Market based and private sector led model
- 15 prefeasibility, 8 feasibility studies
- FIRR: 25-35% (with diesel replacement)
- 5 plants installed at 4 farms
- Biogas used for water pumping, milk chilling and fodder cutting
- Financing model (proposed): linked with replacement of milk chilling cost
- Partnership with milk processing companies (Nestle and Engro) for scaling up

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GHG emission reduction

Two ways

- Manure Management
- Replacement of Diesel

Biogas plant at diary with 100 cows

- Saves 210 tCO_2/yr if the baseline is lagoon
- Saves 41 tCO_2/yr if the baseline is solid storage

Potential for Scaling up

- Over 40,000 farms with >50 animals
- Chillers powered by diesel ⇨ biogas
- Fits with powering agriculture concept
- Financing of biogas plants – installments to be paid from the reduced milk chilling cost
- Nestle and Engro have expressed commitment to scale it up with co-financing

Biogas plants and Financing Need

How to pay the loan ???

How to reach there?

Technology Cost

Biogas

Credit

Subsidy/incentives

Equity

Traditional

Traditional

Biogas

Issues on Financing Biogas Plants

- Energy loans considered as consumption loans and high risk product
- Wholesale fund limited for RE lending
- Partnership between energy companies and MFIs not effective
- High subsidy affects the credit market.

How can milk processing companies change the game?

Farm with 50 milking animals	
Appropriate size of the plant (m3)	75
Estimated cost of biogas plant and generator	$ 8,511
Farmer's equity	$ 2,128
Loan from the Financial institution	$ 6,383
Interest rate	20%
Loan term	24 months
EMI	$ 325

Incentives to the farmers	
Average Milk sales per day (lt)	600
Biogas incentive from milk processing company (PKR 1 per lt of milk)	$ 6.3
Chilling cost from milk processing company (PKR 1 per lt of milk)	$ 6.3
Total monthly biogas incentive from milk processing company	$ 189
Total monthly chilling cost	$ 189
Monthly Total of chilling cost and biogas incentive	$ 379

- Monthly biogas incentive and chilling cost would be enough to pay the monthly installment
- After 2 years farmers can enjoy almost free energy from biogas plants

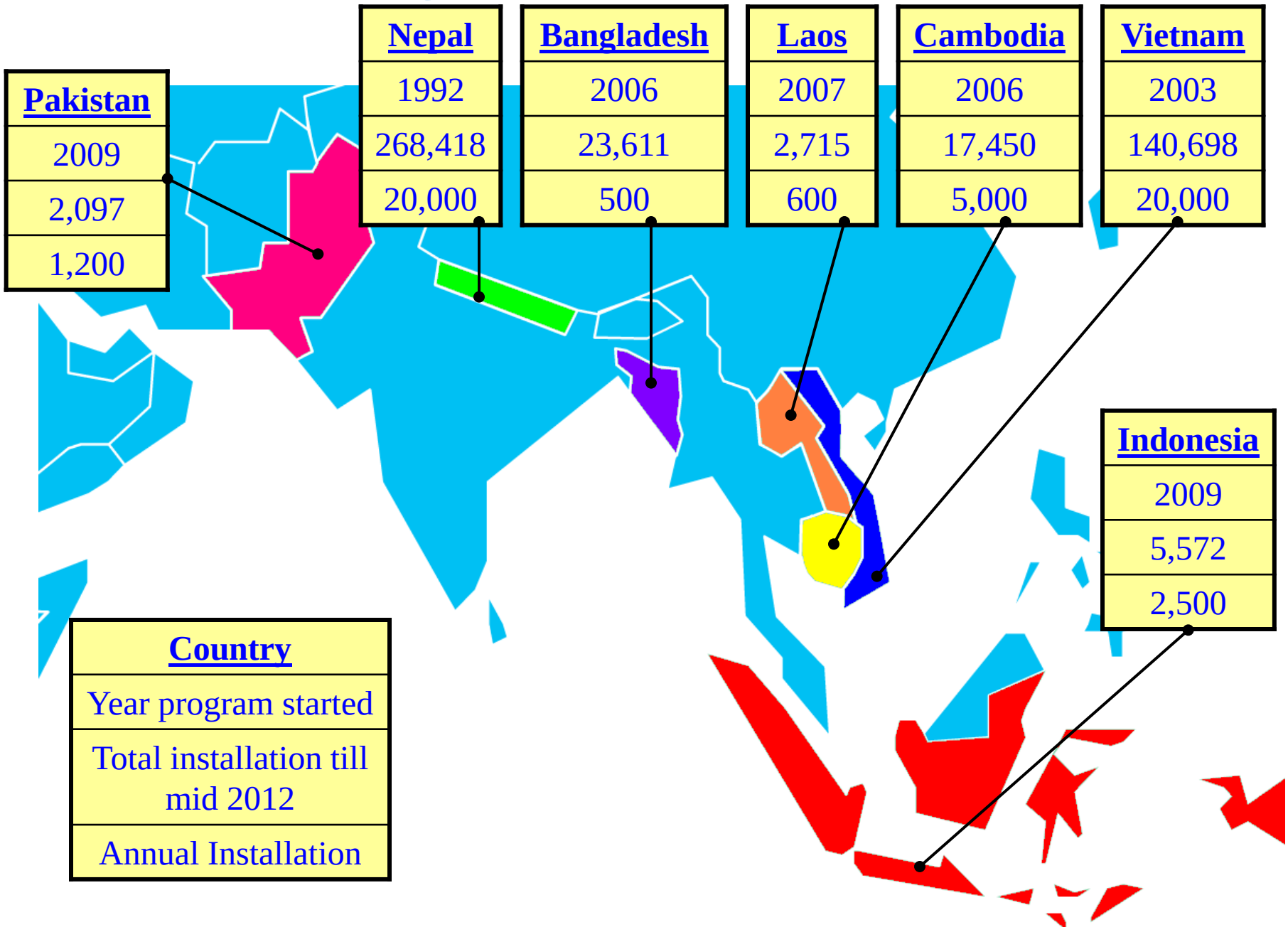
Scaling Up Plan

- Commercial biogas programme
- Target 500 plants in 3 years period
- Potential to Generate 7.5GWh/year electricity

Total Project cost	**5.5 million**
Investment from the farms	3.5 million
Funds required for sector development	2 million

Regional Prospects

Domestic Biogas Development in Asia



Country
Year program started
Total installation till mid 2012
Annual Installation

Pakistan	Nepal	Bangladesh	Laos	Cambodia	Vietnam	Indonesia
2009	1992	2006	2007	2006	2003	2009
2,097	268,418	23,611	2,715	17,450	140,698	5,572
1,200	20,000	500	600	5,000	20,000	2,500

Dairy Animals in Asia

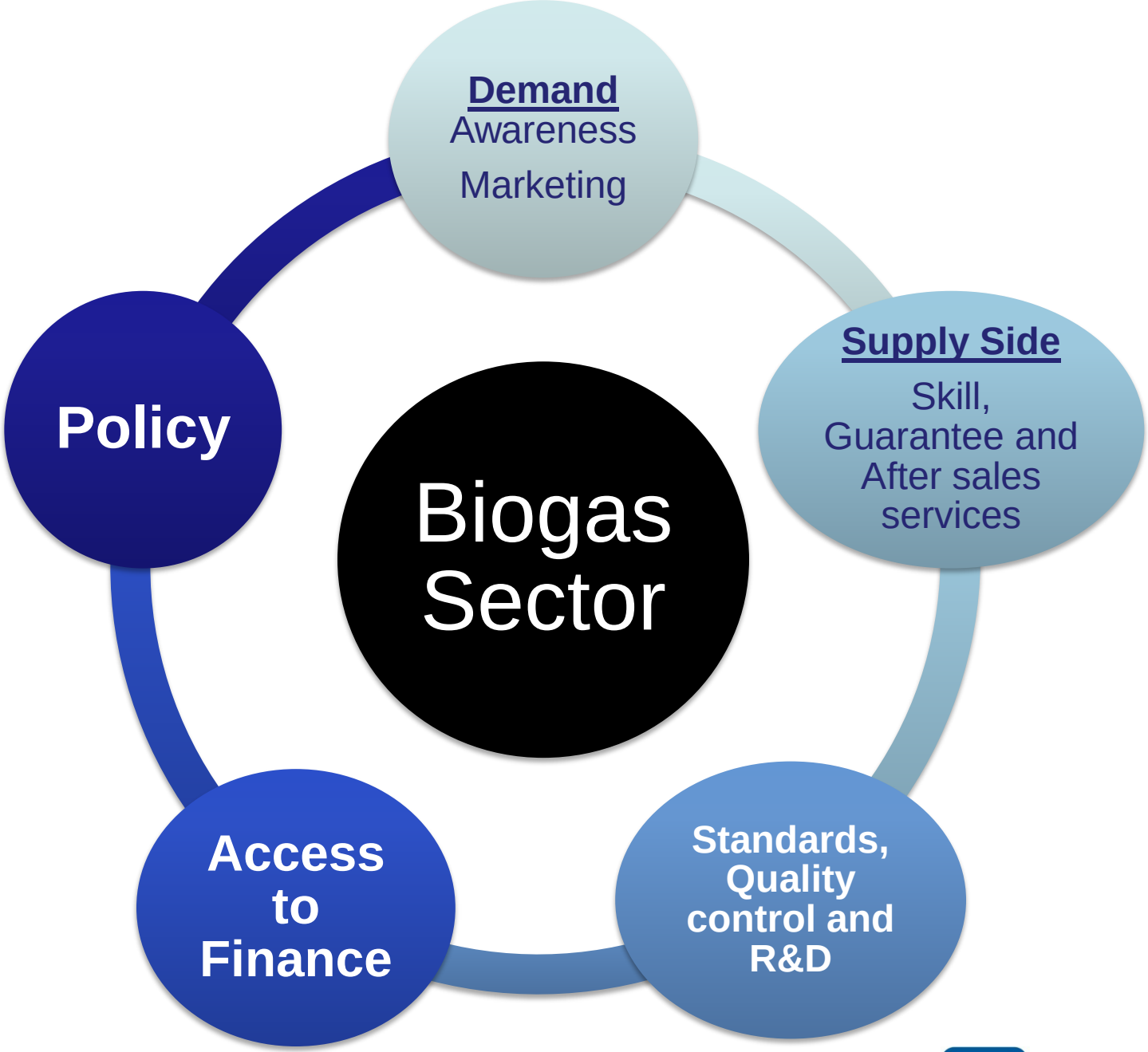
Region	Number of Dairy Animals (,000)			Share of Global (%)		
	1990	2000	2007			
World	324,436	528,273	544,404			
Asia	224,359	258,212	262,207	69	49	48
SE Asia	10,312	12,794	14,266	3	2	3
South Asia	114,079	137,317	154,457	35	26	28

Source: ***Supporting Opportunities for the Smallholder Dairy Sector in Asia: The Challenges for Regional Stakeholders: Asia Pacific Dairy Strategy Project***

Medium Sized Biogas Promotion: Untapped opportunity

- Energy security for SME
- Low cost and attractive return
- Building capacity at local level- Green jobs
- Milk marketing companies can play a significant role
- Methane Capture for energy application

Potential at Poultry and Swine Farms


Demand
Awareness
Marketing
Supply Side
Skill,
Guarantee and
After sales
services
Standards,
Quality
control and
R&D
Access
to
Finance
Policy
Biogas
Sector

Strategic Next steps

- Develop public private partnership project in partnership with milk processing companies.
- Build local capacity across supply chain
- Partnership with financial institutions
- Work out the approach for aggregating multiple plants to capture emissions reductions benefits
- Resource mobilization from multiple donors/private sector


Biogas as a solution for
Energy Security
at dairy, poultry and swine farms