



# **Renewable Energy Policies of Germany and China**

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Masood Ahmed  
CRER, SZABIST  
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# Analytical Framework for Renewable Energy

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## 1. Institutional Change

- Alterations in science, technology and educational policies.
  - Investment in knowledge formation
  - Firms compete to gain influence over institutional framework.

## 2. Generate Markets

- Formation of standards
- Exploring niche markets
- Protected space for the new technology to serve as nursing market.
- Nursing market generate space for a new industry to evolve in.



# Analytical Framework for Renewable Energy

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## 3. Formation of constituencies

- Advocacy coalitions
  - Range of actors, sharing a set of beliefs, compete in influencing policies.
  - Technology specific coalitions
  - Formation of political networks

## 4. Entry of new firms

- Bring knowledge, capital and other resources
- Raise the returns for subsequent entrants
- Strengthen the political power technology specific coalition
- Provide an enlarged opportunity to influence the institutional set up
- Resolve underlying technical and market uncertainties



# Analytical Framework for Renewable Energy

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- Take off period
  - Investments have generated a large enough and complete enough system for it to change gear and begin to develop in self sustaining way.
  - Larger markets are formed
    - Underlying wave of technological and market opportunities



# Germany: Leading the way in RE technologies

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- Early 1970s energy crises
  - Focus on hard Coal and Nuclear Technology
- Mid 1970s
  - Opposition to nuclear Power
- 1980s
  - Efficiency and renewables as first priority
  - R&D for renewable energy raised (DM 300 m in 1982)



# Germany: Leading the way in RE technologies

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- 1980s
  - Political-Economic Electricity supply structure hostile to RE
  - Institutional Changes to support RE
    - Formation of government funded R&D programmes for RE
      - Universities, Firms and Research Institutes.



# Chernobyl Accident 1986

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- Rise of Green
- 100 MW wind programme for demonstration and market formation
  - Guaranteed payment for electricity produced



# Feed In Law 1990

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- Required utilities to connect generators of electricity from renewable energy technology to the grid and to buy electricity ( from wind and solar cells) at a rate amounted to 90% of the average tariff for end customers.
  - Took account of external costs of conventional power generation.





# Effect of Feed-In Law

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- Unimaginable market expansion
  - 20 MW in 1989-490 MW in 1995
  - Emergence of learning networks
    - Wind turbine suppliers-local component suppliers
    - Benefits spilled over to new entrants
  - Growth in the “ political” strength of the industry



# Opposition to Feed In Law

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- Guaranteed rates declined
- Market Stagnation

# Renewable Energy Source Act 2000



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- To support Strong Wind turbine industry
- Rates were guaranteed to investors for 20 years
- Utilities were not excluded from the benefits of law



# China

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- Promotion Law for Renewable Energy Development and Utilization
  - Encourage the development of RE technologies and provide market opportunities for RE companies so that local governments, energy enterprises and the public can themselves promote and utilize RE.



# China

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- RE Policy: Financial Incentives
  - Subsidies
    - Overheads
    - Research and development
      - Commercialization of new technologies
      - Demonstration Projects
    - Low interest rate loans
      - Industrial development of renewable energy
        - Hydro power development
    - Western Province Project Subsidy
      - Township Electrification Program



# China

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- RE Policy: Financial Incentives
  - Tax Incentives
    - Only for biogas and wind ( by central government)
      - Not much support for promotion of RE energy
  - Custom Duties
    - No special incentive for RE products (officially)
    - Enjoy favorable custom duty rates ( Practically)
      - Wind turbines, Photovoltaic Modules
  - Pricing
    - No standard price-setting mechanisms or system exist for renewable energy products
    - Price is set on a case to case basis
      - Grid firms to purchase wind energy even if the price is above the grid average.



# Conclusion

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- Pakistan is at the first phase stage of RE development.
- Substantial funding for R& D in RE is not allocated.
- Government itself is not actively involved.
- Private entrepreneurs are reluctant to take risk due to high political and economic uncertainty. (Unlike India)



# Recommendations

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- Strong role of government is required to create market for RE by investing in demonstration projects
- Awareness in media, political parties, intelligentsia and industrialists about potential of RE technology
  - Development of coalition
- New entrants encouraged by long term Feed in Law like Germany's
- Sindh be taken as a model for developing Wind Energy.