

# **Renewable Energy Technology Transfer - Barrier Analysis**

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# **The Inconvenient Truth – Global Warming**

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# Global Warming

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- Global Warming is:
  - Higher temperature
  - Melting ice cap
  - Rising sea level
  - Rare snow in Beijing
- Global warming is caused by:
  - Human!
    - Greenhouse gas emission, CO<sub>2</sub>, CH<sub>4</sub>, etc.
    - Landscape changes

# Global Warming

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- Global energy consumption increases fast
  - Faster than population growth
  - Imbalanced energy consumption leads to higher consumption in the future
    - Developed countries: above 6 tce per capita
    - Global average: 2.5 tce
    - African countries: 0.5 tce
    - P.R. China: 2 tce
  - The global energy consumption will be 25 billion tce in 2030
- RENEWABLE ENERGY!

# Barriers of RE Technology Improvement and Technology Transfer

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# Barriers of RE Technology Improvement and Transfer

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- Renewable energy
  - Hydropower
  - Wind energy
  - Solar energy
  - Biomass/ Biogas
  - Geothermal/ Tidal
- Main barriers
  - Price
  - Technology
  - Policy and management

# Barrier Analysis (1)

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- Owner of RE Technology
  - Most of the technology owners are not willing to transfer
  - Those technologies transferred always have string attached
    - Overprice technology transfer fee (license, etc.)
    - Market restriction for transferred technology
    - Other commercial restrictions

## Barrier Analysis (2)

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- Receiver of transferred RE Technology
  - R&D capabilities need to be improved
  - Restricted in technology transfer contract
    - Wind turbine design technology: a blueprint without design database
  - Material technology and manufacture technique holding back the transfer progress



## Barrier Analysis (3)

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- Lack of international technology transfer mechanism
  - No one can fight alone against global warming
  - The unnecessary political or commercial barriers of RE technology transfer must be removed

# Suggestions

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# China is important

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- **Renewable energy practice in China**
  - *Renewable Energy Law, Jan, 2006*
  - *Medium and Long Term Development Plan for Renewable Energy in China, Jun, 2007*
  - **Wind concession**
  - **Large scale wind farm planning and grid construction**
  - **Large scale grid connected solar PV demonstration program**

## What Do We Need?

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- Open-minded technology transfer and much more efficient cooperation between developed countries and developing countries will greatly contribute to RE technology improvement and utilization, and to slow down global warming.
- A government guided, enterprise driven, mutual beneficial mode should be built between developed countries and developing countries to integrate capital, technology, resource and market.

## More Suggestions (1)

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- **An international R&D centre for Renewable Energy**
  - **Scientists and engineers from different countries working together**
  - **Training program for R&D people from developing countries**
  - **Joint effort to improve technical capability of developing countries and promote renewable energy utilization globally**

## More Suggestions (2)

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- An efficient mechanism which encourages RE technology transfer and innovation
  - Policy should be made in developed countries to support private companies transfer RE technology to developing countries
  - Technology transfer should be more practical and focus on capacity building

## More Suggestions (3)

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- A helping hand to developing countries to build up their RE industry
  - In the future, most of the global energy consumption growth will be in developing countries
  - We will all benefit from a prospective RE industry in developing countries



## Conclusion

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- ❑ Developing renewable energy is important to win the battle against global warming
- ❑ Win this battle in developing countries will lead to a global victory
- ❑ A effective technology transfer mechanism is needed



**Thank You!**

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