Policy and Promotion of Offshore Wind Power in Taiwan

Thousand Wind Turbines Project

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operated by Industrial Technology Research Institute
supervised by Bureau of Energy, MOEA
Overview

- Wind Resource in Taiwan
- Promotion Target & Strategy
- Demonstration Incentive Program
- Technical Aspects
Taiwan Offshore Wind Potential

- **Shallow Water** (5-20 m)
  - Area: 1,779.2 km²
  - Potential: 9 GW
  - Feasible: 1.2 GW

- **Deep Water** (20-50 m)
  - Area: 6,547 km²
  - Potential: 48 GW
  - Feasible: 5 GW

- **Deeper Water** (> 50 m)
  - Potential: 90 GW
  - Feasible: 9 GW

Contour simulated by NCAR WRF 3.0 model

## Thousand Wind Turbines Project

- **Short-term Target**: 4 demonstration offshore wind turbines by 2015.
- **Mid-term Target**: Offshore 600 MW, total 1,800 MW by 2020.
- **Long-term Target**: Offshore 3,000 MW, total 4,200 MW by 2030.

### Installed Capacity (MW)

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>MW</td>
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</tr>
<tr>
<td>Onshore</td>
<td>621</td>
<td>314</td>
<td>866</td>
<td>350</td>
<td>1,200</td>
</tr>
<tr>
<td>Offshore</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>4</td>
<td>600</td>
</tr>
<tr>
<td>Total</td>
<td>621</td>
<td>314</td>
<td>881</td>
<td>354</td>
<td>1,800</td>
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Ref. Bureau of Energy, Ministry of Economic Affairs, TAIWAN
Promotion Strategies

- **Feed-in Tariff (FIT)**
  - Onshore: TWD2.6258 (€6.73c) / kWh during 2013
  - Offshore: TWD5.5626 (€14.26c) / kWh during 2013

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- **Offshore Demonstration Incentive Program (DIP)**
  - Officially announced on 3rd July, 2012
  - 4 Demonstration Turbines by 2015, 3 Demonstration Wind Farms by 2020
  - Government provides subsidy for both equipment & developing processes

- **Zonal Development**
  - Industrial Zone for offshore wind farms (e.g. Round 3 of UK)
  - Commercial scale for cost down
3 Demonstration Wind Farms

- Winners (Fuhai, Haiyang) officially announced on 9th January 2013
- Subsidize 50% cost of the Demonstration Turbines (FIT advances/interest-free loan)
- Subsidize TWD250M for preparatory (wind mast, EIA, etc.) expense
Specifications & Requirement of DIP

- **Demonstration Wind Farm**
  - Water depth: 5 m or more
  - Total capacity: 100-200 MW
  - Commissioned by 2020

- **Met Mast**
  - Water depth: 10 m or more
  - Height: 70 m or more

- **Demonstration Turbines**
  - Capacity: 3 MW or more
  - Commissioned by 2015
Technology Gaps

- **Design Analysis**
  - Turbine design resistant to typhoons
  - Foundation design resistant to earthquakes

- **Environmental Impact Assessment**
  - Migrating birds & ocean mammals
  - Local fishery, navigation and harbor development

- **Project Management**
  - Risk assessment and mitigation
  - Vessel coordination and construction scheduling

Pictures by: Vergnet, YCPS, Centrica
European Experiences of Wind Farm Development

- **Strategy**: demonstration vs commercial
- **EIA solutions**: navigation, fishery, environmental activists
- **Onshore Infrastructure**: design of onshore base for offshore wind farm industry
- **Future**: plans for floating turbines in deeper sea

Taiwan Offshore Demonstration Wind Farm Project

- **Developer**: general consulting, project management and risk management
- **Equipment**: typhoon-proof design technology
- **Service**: marine construction and O&M

Offshore Test Wind Farm

- **Offshore test site for new turbine technology** (e.g. Hunterston or EOWDC)
Thanks for Your Attention

Thousand Wind Turbines Promotion Office
http://www.twtpo.org.tw