Wind energy is Economic power

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Chonbuk National University
1. The wind power system industrial forecast
2. Wind energy leading country – Germany
3. Saemangeum area, Korea and wind energy
4. Wind power system development and production procedure
1. The wind power system industrial forecast
Enercon’s new system
Wind power

- Tighten up on environmental Regulation - CO2 reduction trend
- Worldwide demand increase - Average 45% up Yearly average 30% up
- Job creation effect - 15P/M.Watt - Transportation - Training on wind power system

- EU is changing renewable energy (almost wind power) in place of nuclear energy
- Asia market is extending wind power about 70%
Global market trend

Annual Global Wind Power Development

CAGR: 22.5%

Main country

America

China

2008 Installed Capacity

EU 54%
- Germany 20%
- Spain 14%
- Others 15%

2020 Installed Capacity

EU 32%
- Germany 7%
- Spain 6%
- UK 4%
- France 4%
- Others

Source: Collins Stewart Research
Korea market situation

CAGR 23.8%

Source: Global Wind Turbine Markets and Strategies, 2008-2020-EER
2. Wind energy leading country – Germany

- New W.P
- Old W.P
Germany’s wind power

Choose Renewable energy act - Fossil energy reduction

Political support - Getting Sales network and buying energy

Energy Self-supply More than consumption

Higher employment

Co2 emission decrease

Small towns Economic revival For resident

Make a planning

Wind power Complex, Wind Park

Direct investment raise funds to other nations

82,000 (’06) -> 100,000 (’07) up
From ’90 to ’02
13.8%
Dardesheim, Germany

- Average 120,000~130,000 MWh production
- More than 15 times of resident demand
- After sales, return the profit to resident

Job creation for resident
- Energy information center
- Transportation
- Technician on wind power system

Joint venture
- Investment for residents
- Royalty
3. Saemangeum area, Korea Jeollabuk-do, the largest sea wall in the world

100,000 acre

33 km
Wind Power System in Gunsan City

wind park in Gunsan City, Jeollabuk-do province
Saemangeum area, country economy

- Potential power
  - self-support in Korea
- Cleaning air
  - CO2 emission Reduction In Korea
- Job creation
  - Employment on wind industry almost 20,000
  - About 1000 company promotion
Saemangeum area
Saemangeum area will be the mecca of wind power System industries.

overseas expansion to export
Because of High efficient wind turbine system,
Component and technology in industrial area

- Make large wind park, complex like Germany
- Domestic enterprise, components,
  and materials technology improvement

Gochang, Buan, Gunsan, Kimje (West island, Sunyudo)
Obtain Korea company in wind power filed.
Develop local, rural wind park and complex.

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出口

发展

形成

麦可

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4. Product procedure
Real time wind turbine power system
Real time wind turbine power system

1. Auto wind tracking by three Rudder
2. Efficient power system by low speed generator
3. Easy maintenance system by furling blade
4. 30% longer life than conservative power system
• Product Life cycle will extend.
  (3~5 years → more than 7 years)
• It is appropriate for small ship, good yacht.
• It is furling the blade system for wing safety.
• It is possible to decrease 30% electrical rates, to support self power and save energy.
• It is able to install housing roof and beach, building, street lamp.
• It will require only notice report to administration.
  (its capacity is within 20KW)
• It works on the battery, charging electricity and decreases energy price. (Inverter, converter)
실용신청등록증
등록 제 0364737호
송신번호 제 2004-0012491호
송신일 1994년 07월 07일
수수일 594년 10월 03일

고안의 명칭: 실용신청등록증

실용신청인: 김봉순(540731-1481515)
주소: 전라북도 전주시 덕진구 전북2동 1166 거성1로 22호

고 안 사람: 김봉순(540731-1481515)
주소: 전라북도 전주시 덕진구 전북2동 1166 거성1로 22호

위의 고안은 실용신청등록증에 의하여 실용신청등록
원부에 등록되었음을 증명합니다.
2004년 10월 04일

특허청

This utility model is a technical innovation that has been formally registered under the Utility Model Act, and it is hereby certified that it has been registered.
2004년 10월 04일

특허청

The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1993, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1993, the term of this patent is twenty years from the U.S. filing date subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extensions.

Date: 2004년 10월 04일

[Signature]

Director of the United States Patent and Trademark Office
JAPAN

实用新案登録証

JAPAN

CHINA
The following activities

1. Design Assessment
   - 1 Load assumptions
      (according to IEC61400-2:2006, simplified load assumptions)
   - 2 Evaluation of safety system and manuals
   - 3 Evaluation of rotor blade
   - 4 Evaluation of machinery components
   - 5 Evaluation of the tower (tubular steel tower)
   - 6 Evaluation of foundation (flat foundation)
   - 7 Evaluation of electrical components
   - 8 Project management and coordination
      in respect of the design assessment
   - 9 Statement of compliance for the design assessment

From DEWI–OCC
2. Prototype Testing

-1 Witnessing of safety and function test
-2 Evaluation of prototype measurement report
   (submitted by an institute accredited to IEC 17025)
-3 Witnessing of rotor blade test, issue of a technical report
-4 Statement of compliance for the prototype testing
★ 3. Manufacturing Evaluation

-1 Manufacturing Evaluation nacelle assembly
-2 Evaluation of quality system nacelle assembly

Issue of a technical report

-3 Statement of compliance for the manufacturing evaluation

★ 4. Type certificate

-1 General project management
-2 Type certificate
Wind Turbine System by Fluid torque converter

- This system is working efficiently by fluid torque converter in place of shaft and gear unit.

Wind Turbine system by Gear set

New conceptual system
By fluid torque converter
This system will decrease Nacelle weight and Tower weight 30% down than conservative one.

Fluid Torque system, cooling set, generator, control set will fix on the earth.

Maintenance is very simple for control system, cooling all the repair set.

It is very good for free yaw because of lower weight and smaller system assembly.

Stability will be good for nacelle and...
High efficiency and environment friendly wind power generator having a function of breaking yellow sand.
High efficiency and environment friendly wind power
having a function of breaking yellow...
High efficiency and environment friendly wind power generator having a function of breaking yellow sand
High efficiency and environment friendly wind power generator having a function of breaking yellow sand.
High efficiency and environment friendly wind power generator having a function of breaking yellow
**Main Characteristics**

① We can install two different turbine system in the one tower. The one is half size system in the front area of nacelle and another can fix downwind turbine system in the back side of nacelle. Therefore, we can be produced 25% up electric power generation.

② The two rotating blade in the front turbine system will amplify air spread and density and then, the three large rotating blade in the back turbine will decrease air pollution and sandy effect for purifying air.
③ Front wind turbine system install all kinds of control set and generator in the nacelle. After installation, those system will keep equal balance for total equivalent stability. Because the weight of three back rotor blade is very heavy in the system.

④ Foremost front hollow pole will keep total equivalent stability and decrease vibration in the total system.

⑤ Upper rudder and lower rudder in the nacelle will keep good wind direction and stability very well in the whole system.
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<th>1step</th>
<th>2step</th>
<th>3step</th>
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<tbody>
<tr>
<td>Investor</td>
<td>• Certification, verification, test at DEWI-OCC</td>
<td>• manufacturing plant establishment In Germany (core component)</td>
<td>We will open plants In Korea, Africa, Middle East, China, America, Canada, East Asia, South America</td>
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<td>• Successful prototype production for wind power system in 20Kw.</td>
<td>• assembly plant establishment In Korea, Saudi Arabia, U.S.B</td>
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<td>Technician</td>
<td>• Technician education Expert training</td>
<td>Instruction for expert and employer, • mass production for manufacturing process</td>
<td>• Each nation expert training • by region, branch establishment • Equipment installation Training</td>
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<tr>
<td></td>
<td>• Goods development</td>
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<td>• Preparation for mass production</td>
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Like seed of dandelion