

Introduction to the study on Repowering of old wind power projects in India

Need and Benefits of Repowering

- » More wind power from the same area of land:
 - » wind power generation is multiplied without the need for utilising additional land;
- » Fewer wind turbines:
 - » the number of turbines can be reduced while enhancing the natural landscape. The construction height can be raised;
- » Higher efficiency, lower costs:
 - » modern turbines make better use of available wind energy. The cost of production is significantly lowered;
- » Better power grid integration:
 - » modern turbines offer much better grid integration, since they use a connection method similar to conventional power plants and also achieve a higher utilization degree;
- » Better appearance:
 - » modern turbines rotate at much lower speeds and are thus more visually pleasing than older, faster-rotating turbines;

Repowering Experience in Germany – (1/3)

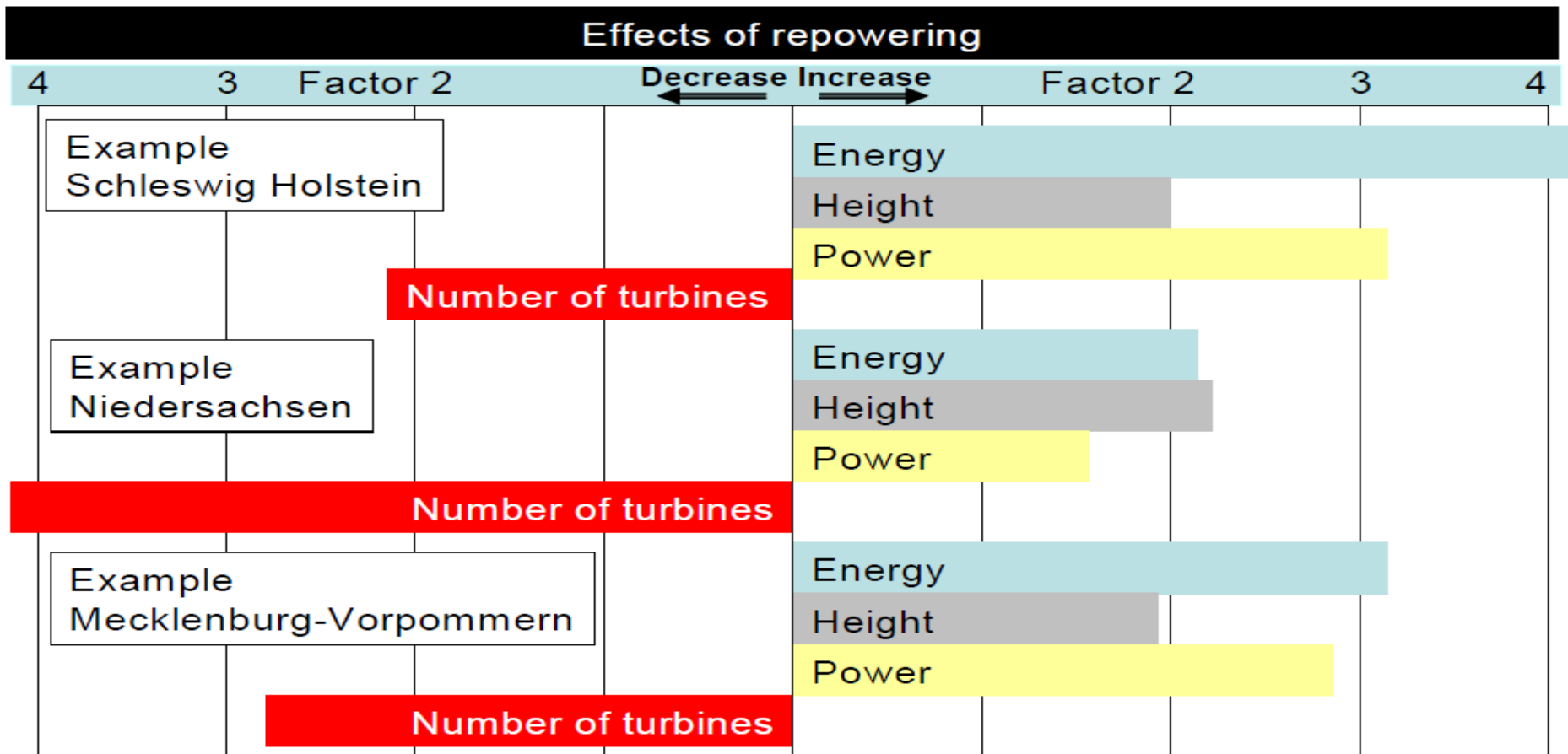
» German Renewable Energy Sources Act (EEG)

- » Amendment to the **Renewable Energy Sources Act (EEG) in 2004** offered an additional financial incentive to repower turbines installed before 1995.
- » With **amendments in 2009**, more attractive conditions for repowering projects which includes additional increase in initial tariff for wind turbines by 0.5 cents/unit above the initial feed in tariff of 9.1 cents/ unit.
- » Resulted in conversion of 59.3 MW of old turbines into 168.5 MW with a repowering factor of 2.84

» German Wind Energy Association

- » repowering potential upto 2020 is 15,000 MW
- » carried out a study to analyze effect of repowering

Repowering Experience in Germany – (2/3)

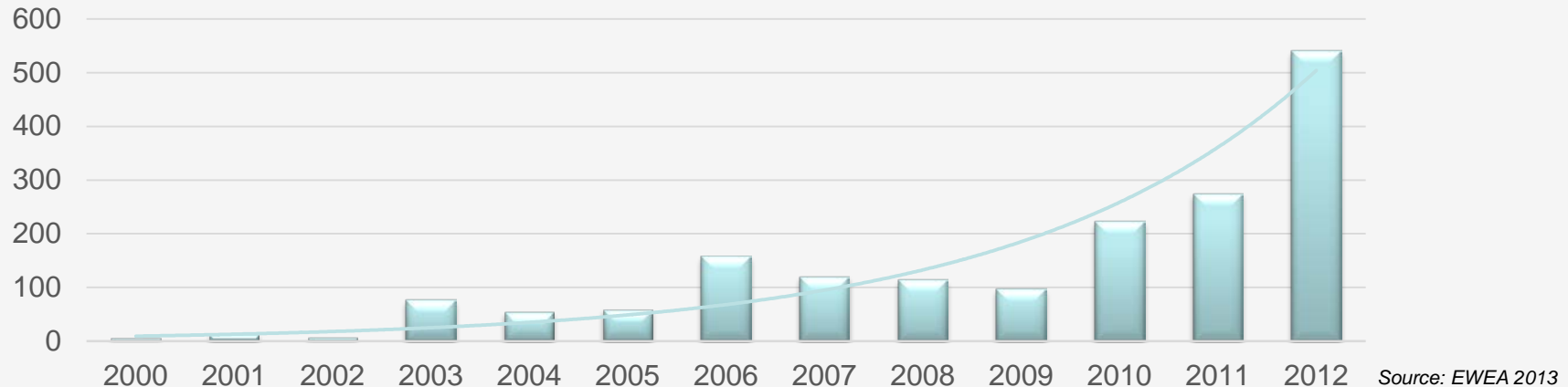


Source: EWEA 2013

Repowering Experience in Germany – (3/3)

- » At the end of 2012, there were 22,962 onshore wind turbines in Germany (Deutsche WindGuard, 2013)
- » Out of these, 9,359 are at least 12 years old (DEWI, 2013).
- » Capacity added through repowering at the end of 2013 was 1742MW (DEWI, 2013).

Capacity Addition through Repowering (MW)



From 2007-2012, WTG capacity addition through repowering has achieved CAGR of 32% as against 6.2% CAGR for greenfield wind projects.

Objectives : Repowering Study by IGEF

- » **Indo-German Energy Forum (IGEF) – Support Office** has initiated study to evolve a framework to promote the concept of Re-powering of wind turbines.
- » In this context, the IGEF Support Office has engaged M/s Idam Infrastructure Advisory Pvt. Ltd (Idam Infra) to carry out the study and engage with key stakeholders in the wind industry.
- » The study is supported by MNRE and NIWE.

Objectives of the Study

- To understand Repowering market developments: Global & Indian
- To analyze major factors influencing decisions of repowering investments
- To evaluate financing requirements for repowering project(s)
- To evolve policy and regulatory measures needed to pursue repowering in India
- To estimate total market potential and assess the business opportunities for repowering in India

Outcomes of the Repowering Study

Draft Report on Repowering

Market potential assessment

Repowering project implementation procedure

Feasible Business Model

Incentive Structure

Note on repowering implications on captives & proposed solution

Draft Repowering Policy

Roles & Responsibilities of major stakeholders

THANK YOU !!!