Starting Repowering of existing Wind Parks at an early stage

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## Agenda

What is the best time to start the repowering process in the life-cycle of a wind project?

1. Arguments for an early start of Repowering
2. Arguments for a late start of Repowering
3. Time line: 3 Cornerstones
4. When does Repowering start in France?
5. Conclusion
1. Initial Question: Arguments for an early start

What is the best time to start the repowering process in the life-cycle of a wind project?
1. Initial Question: Arguments for an early start

→ Virtually, Repowering can’t be considered too early
2. Initial Question: Arguments for a late start

What is the best time to start the repowering process in the life-cycle of a wind project?

“Repowering activity in Germany has lost momentum”

“We are likely to see a dip in activity for the next years”

“Little to no CAPEX savings.”

→ There is no need to consider Repowering right now as it is too early to start.
3. Time line of a Repowering Process: 3 Cornerstones

Conflicting priorities: early vs. late start of Repowering process

Operation time of existing wind farm

Operation time of new wind farm

Year of op.
12 14 16 18 20

1. Starting „lookout-position“ for Repowering
2. Starting planning process for Repowering
3. Technical or economic time for dismantling

Building Permission
Dismantling
Commissioning of new wind farm

12 14 16 18 20
3. Cornerstones: The point of time for dismantling

What is the best time to dismantle a WTG?

Technical aspects

- Failure of pivotal components or total damage
- Limited availability of spare parts
- Possibly limited building permission (rare)
- Grid conformity

Economic aspects

- Operational costs exceed revenue
- Opportunities in new wind park are higher than expectable operating profit
- Optimal performance increase factor (kWh new wind park / kWh existing wind farm)
- Expected tender process has influence on profitability

→ Technical and economic aspects can define the best time to replace a WTG, but the planning process has to start years before.
3. Cornerstones: Planning-phase - 4 to 6 years ahead

What is the best time to start the planning process for repowering?

- All „normal“ planning steps, known from Greenfield planning.
- „Repowering projects are as complex to permit as regular projects and cost about the same, too“
- The planning process for Repowering is often shaped by old disputes that may resurface. Careful and time-consuming talks need to be made.
- If well prepared, the planning process for repowering is less stressed by competition.

→ Between 4 to 6 years before dismantling, depending on the region and the complexity of the project.
3. Cornerstones: „Lookout“-phase - around 10 years ahead

What should be done during „lookout“-phase?

<table>
<thead>
<tr>
<th>Access to land plots</th>
<th>Designated area</th>
</tr>
</thead>
<tbody>
<tr>
<td>„lookout-position“ starting around year 10 of operation</td>
<td>By keeping an eye on realignments of designated areas, it is possible to influence them at an early stage.</td>
</tr>
<tr>
<td>Suggestion to hold regular consultations with land owners</td>
<td>Debates should be used to cut legal limitations in t.ex. hub heights as soon as possible.</td>
</tr>
<tr>
<td>Particular activity after changes in designated area</td>
<td></td>
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</tbody>
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→ lookout-phase **starts around 10th year of operation**
→ lookout-phase should be used to keep an eye on developments in land securing and land designation and consider whether Repowering is basically possible.
4. When does Repowering start in France?

- In 2016 more than 1.7 GW of wind energy grow older than 10 years and are **worth it to be put on a „lookout-position“**. 134 MW should be checked for the **planning phase**.

- **First** Repowering projects in **Germany** started in **2006** (Bloomberg 2016). Complementary, **activity in France is starting right now**.

![Graph of cumulative repowering capacity in France](source: own presentation, data from Observ'ER, 2015)
5. Conclusion

→ Repowering needs a pre-phase, the „lookout-phase“, roughly around 10th year of operation.

→ Planning-phase should start 4-6 years before scheduled dismantling after careful consideration if Repowering is basically possible.

→ For an efficient Repowering, activity in France could start right now.
Thank you for your attention.

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Sources
