

IEA Wind TCP Task 11

Digital innovations to improve wind energy contribution to ES 2050



Lionel Perret, OA Task 11 Base Technology Exchange

Renewable Energy Director, Planair SA

IEA Networking Event Switzerland

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Task Objectives & Expected Results

- **Topical Expert Meetings:** Meetings on different topics are intended every year, gathering active researchers and experts.
- Develop **Recommended Practices** in collaboration with other Tasks
- Provide room for exchanges within the wind energy expert community : implement an online community
- Explore collaboration with other TCPs
- Current Term: 2017-2018, Extension 2019-2020

Task11 activities :

Recommended Practices as Basis for Standards



- Recommended practices serve as pre-normative guidelines in advance of formal standards
- 16 recommended practices have been issued

**Small Turbine
Consumer Labels**

**Cold Climate
Wind Projects**

**Social Acceptance
of Wind Projects**

**Remote Sensing for
Resource Assessment**

**Wind Integration
Studies**

**Wind Farm Data and
Reliability Assessment**

**Floating Lidar
Systems**

**Wind/PV Integration
Studies, Ed. 2**

**Micro-Siting
of Small
Wind Turbines**

Forecasting

2011 2012 2013 2013 2013 2017 2017 2018 Under Development
2018/19

Task 11 activities :

Online Community Platform



- Planair led the selection process for the provider and assisted Cezanne during implementation
- More than 1300 users uploaded
- More than 20 active communities
 - Communities created for each TEM event → quick overview on who has participated and which presentations were given
 - News Feed from the TEM to inform the IEA Wind TCP community
- More than 12 events organized over the platform

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Task11 activities :

Dedicated Topical Expert Meeting (TEM)



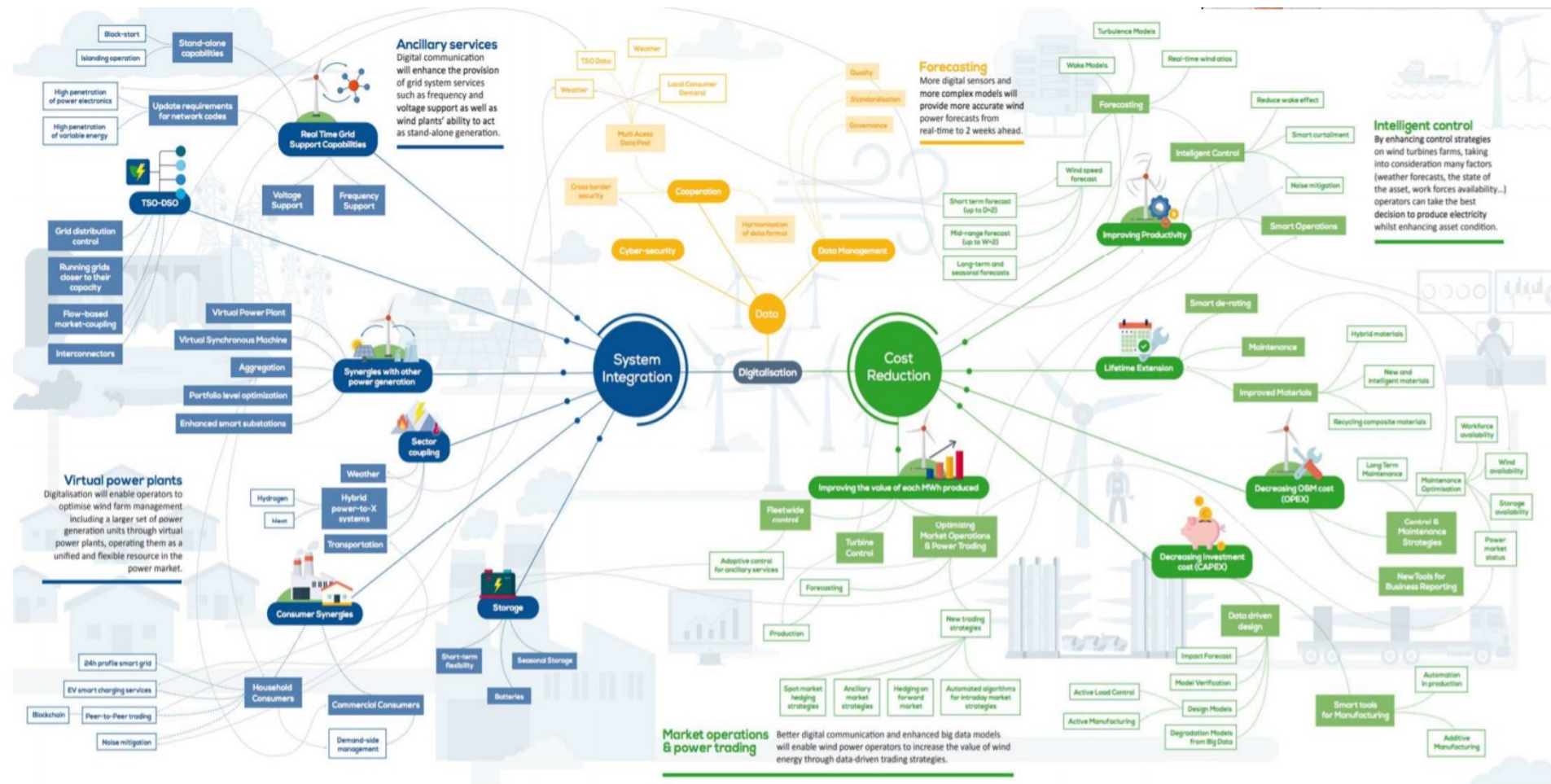
- TEM selection in alignment with strategic plan and member votes
- 6 TEMs organized (+ 1@DTU in Dec.) since Apr 2017
- > 200 participants from 99 different organizations

92	Wind Energy & Digitalization	2018	Dublin, Ireland	Community Page
91	Durability and Damage Tolerant Design of Wind Turbine Blades	2018	Bozeman, MT, USA	Community Page
90	Strategic Dialog for Community and Distributed Wind	2018	Copenhagen, Denmark	Community Page
89	Grand Vision for Wind Energy	2017	Golden, USA	Proceedings
88	Three-Way V&V between Data, High-Fidelity Models, and Engineering Models	2017	Glasgow, Scotland	Community Page
87	Smart Structures for Large Wind Turbine Rotor Blades	2017	Roskilde, Denmark	Community Page

Wind Energy Digitalization- wild eyed possibilities



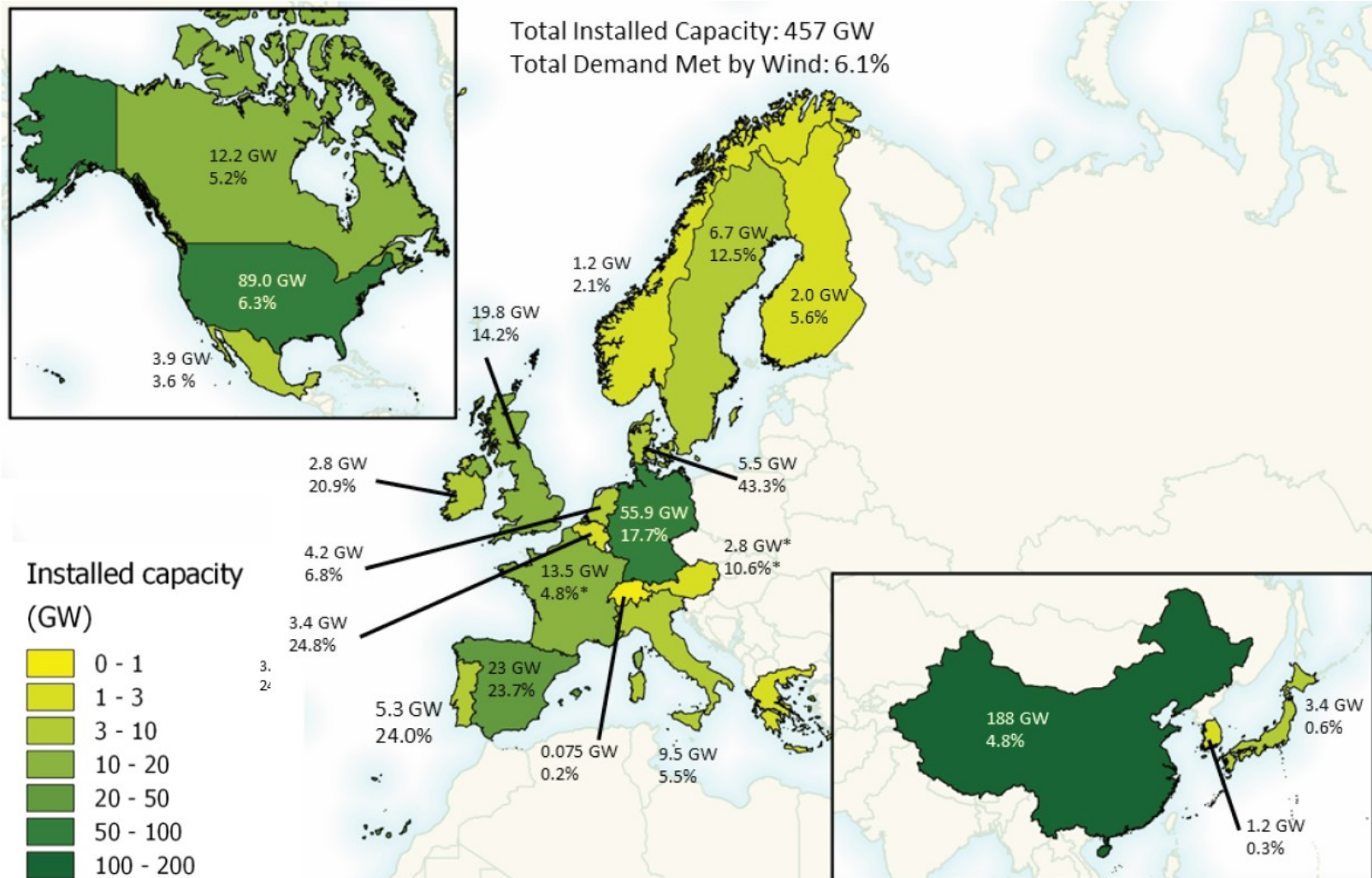
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Switzerland : the only IEA Wind country with less than 1 GW Wind Energy... (0.075 GW)



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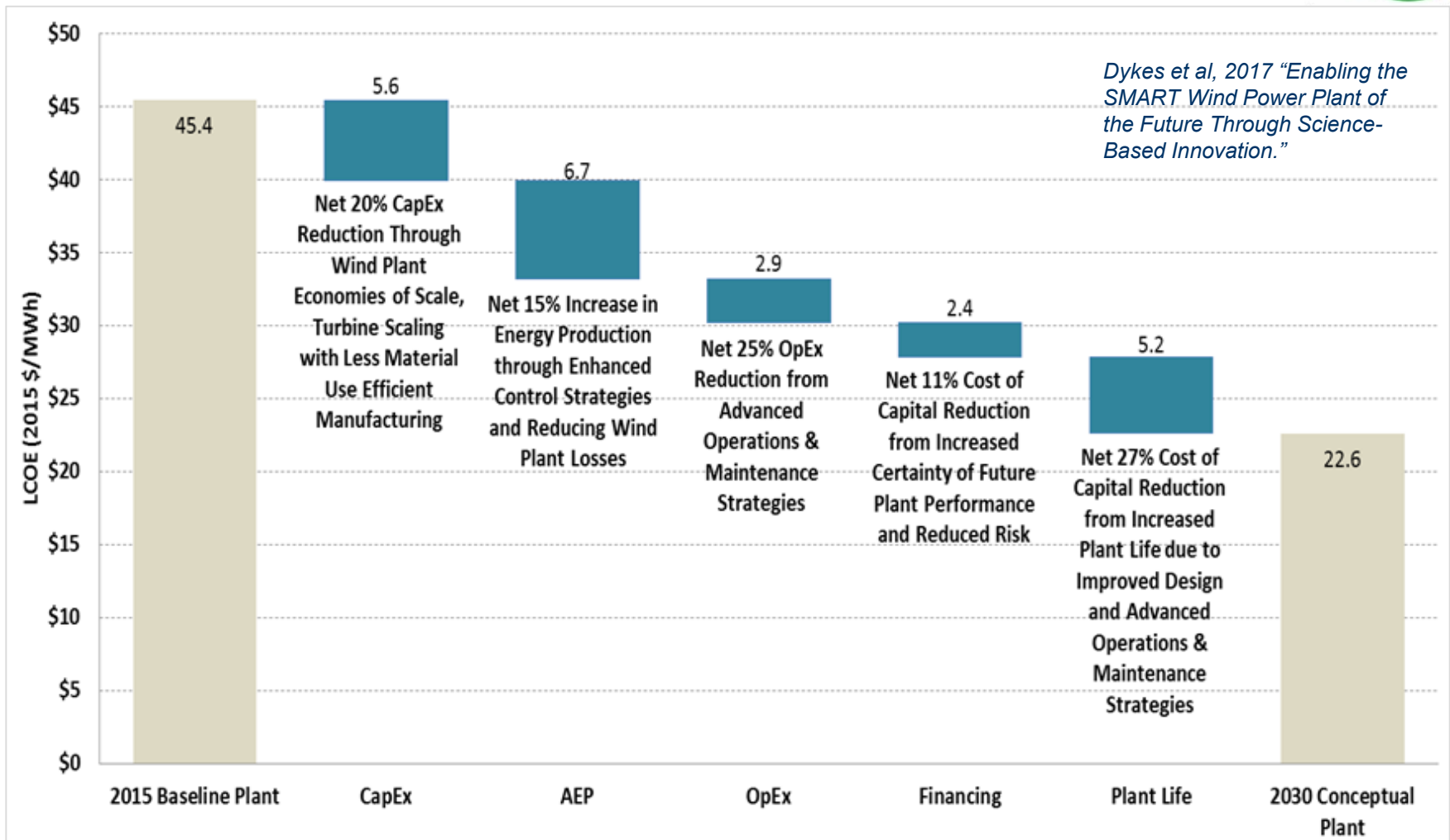


**How can digitalization contribute to increase
Swiss Wind power deployment to (min) 2 GW ?**

Digitalization as key driver for cost reduction



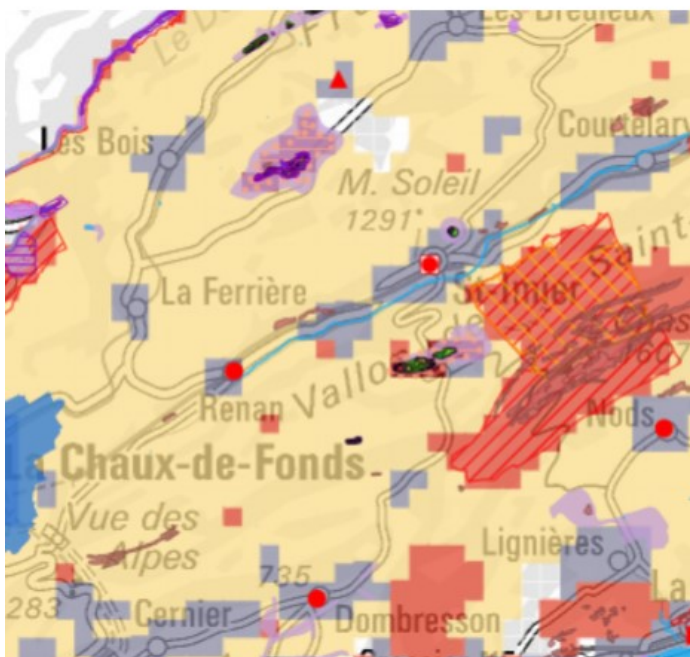
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Innovations enabled through advancements in atmospheric physics, wind plant optimization, and plant-level control could reduce land-based wind costs an additional 50% by 2030

Digitalization to increase acceptance and reduce environmental curtailment

federal government interests ⓘ



Full screen

- Building zones with buffer (noise abatement)
- Protected areas without a balancing of interests
- Areas to be excluded in principle
- Areas subject to inter-authority coordination (not exhaustive)

Small lands with a lot of constraints

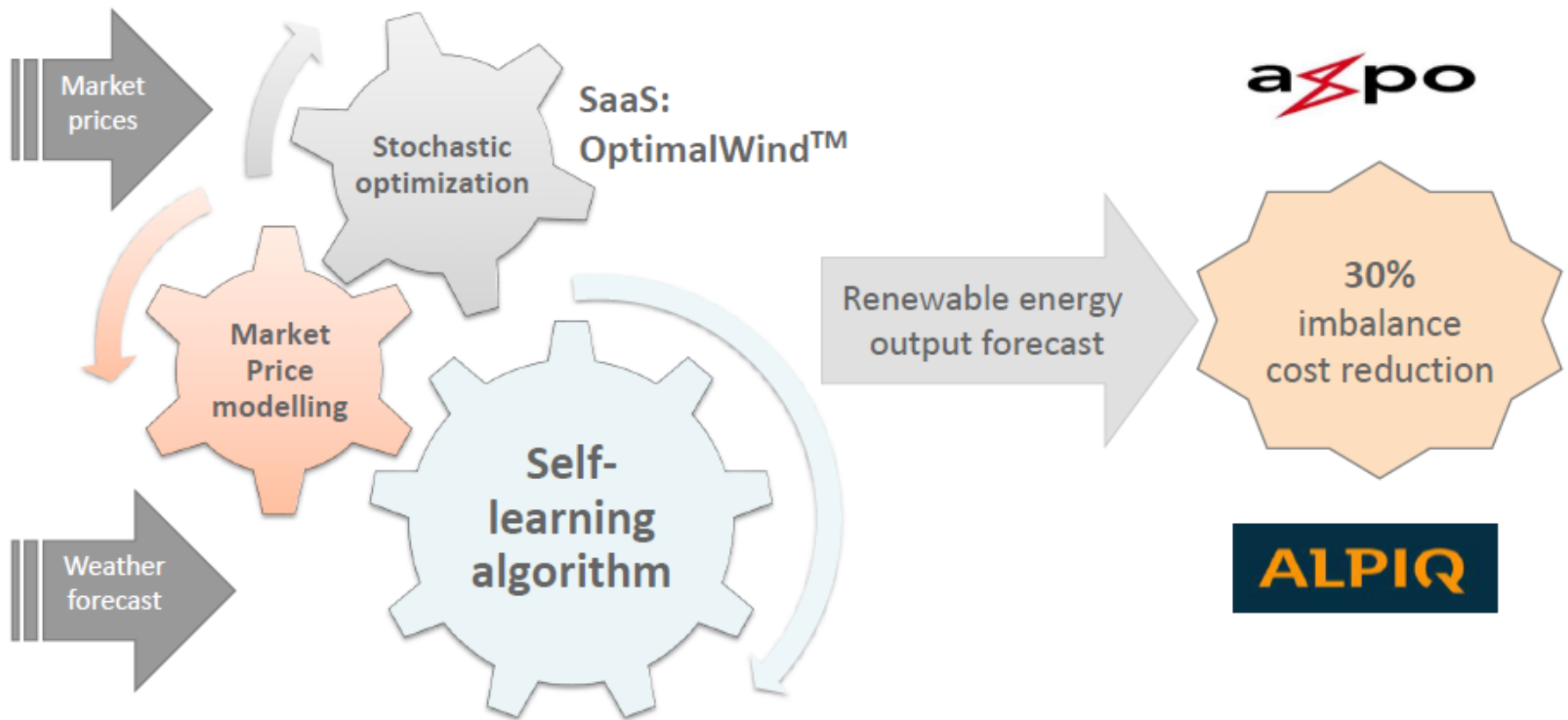
Example of typical loss of production due to territory constraints :

- Noise 10%
- Wake 4%
- Icing 4%
- Birds 4%
- Bats 2%
- Radio Link 2%
- Military coordination 3%

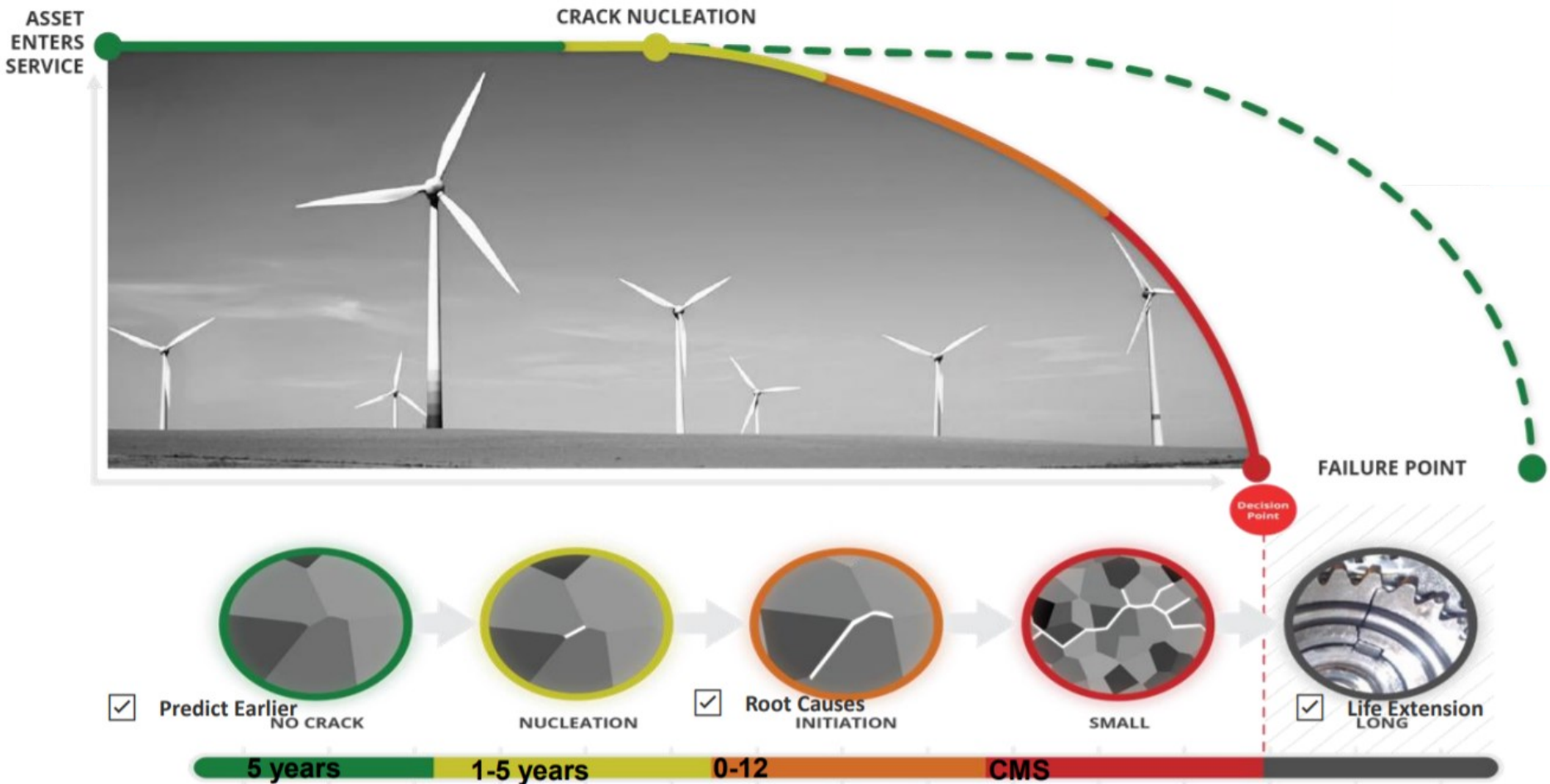
Research field for production optimization with advanced mitigation of all constraints

Digitalization to reduce imbalance cost

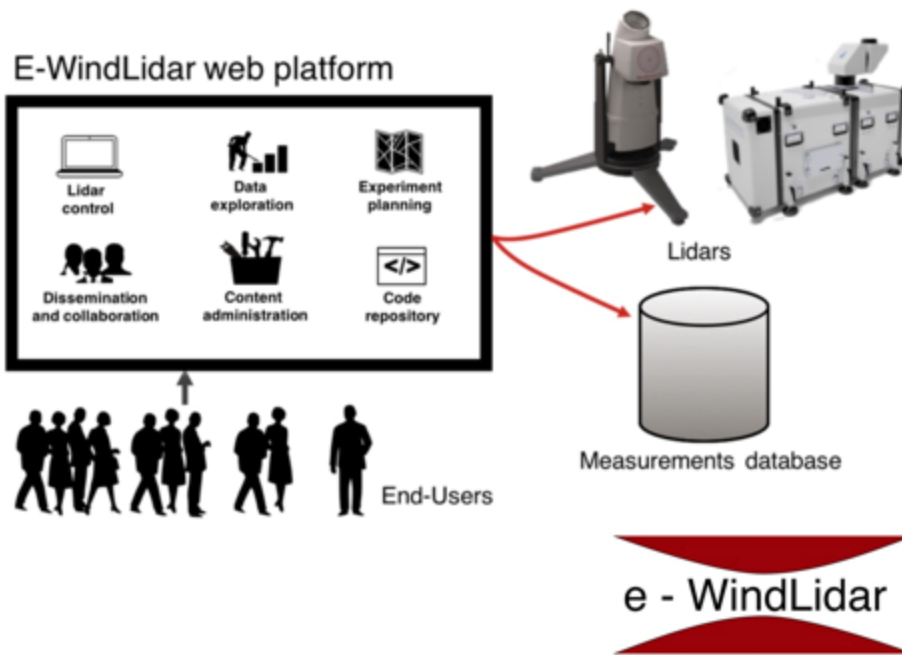
Swiss digital solution Samawatt



Digitalization for lifetime extension and failures detections



Digitalization to consolidate resource assessment in complex terrain



Source: N. Vasiljevic, DTU

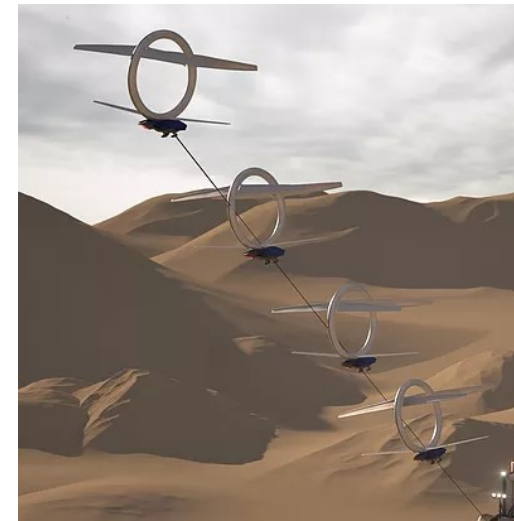
Developing community data tools:

- Helps deal with the flood of data from lidar and wind energy
- Enables the use of lidar in complex terrain

Outcome:

- Lidaco data converter released and triallyd

Additional 2050 potential : High wind technologies enabled by advanced algorithms



Thank You!!

Lionel Perret

Planair SA

Rue Galilée 6, CH-1400 Yverdon-les-Bains

ieawindtask11@planair.ch

<https://community.ieawind.org/task11/home>

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