



Ensuring biodiversity while implementing green energy transition

COP30 Belém, Brazil
Anna Suuronen
Finnish Environment Institute



Suomen ympäristökeskus
Finlands miljöcentral
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Programme



Keynote speech by **Anna Suuronen**,
Finnish Environment Institute



Comments by

- **Izabella Teixeira**, Co-Chair of the IPBES
- **Kaisa Mustajärvi**, Development manager,
City of Tampere and Professor of practice,
University of Jyväskylä



Biodiversity and the energy transition



Land use demand of renewable energy



The state of ecosystems and biodiversity targets



Site selection conflicts and synergies



Important nature values



Examples of nature-based solutions



Short roadmap for sustainable site selection

There is a global need for shifting to renewable energy

- Shift to renewable energy is needed to halt carbon emissions
- Production of renewable energy in large scale requires a lot of land and is in potential conflict with other land use and nature values.
- According to International Renewable Energy Agency (IRENA) total renewable power generation capacity will need to triple by 2030 to remain on a 1.5 °C
- European Environmental Bureau: *“Only 2.2% of the EU’s total land will be required for current and future solar and wind projects to allow the EU to phase out both fossil fuels and nuclear power and reach climate neutrality by 2040”*

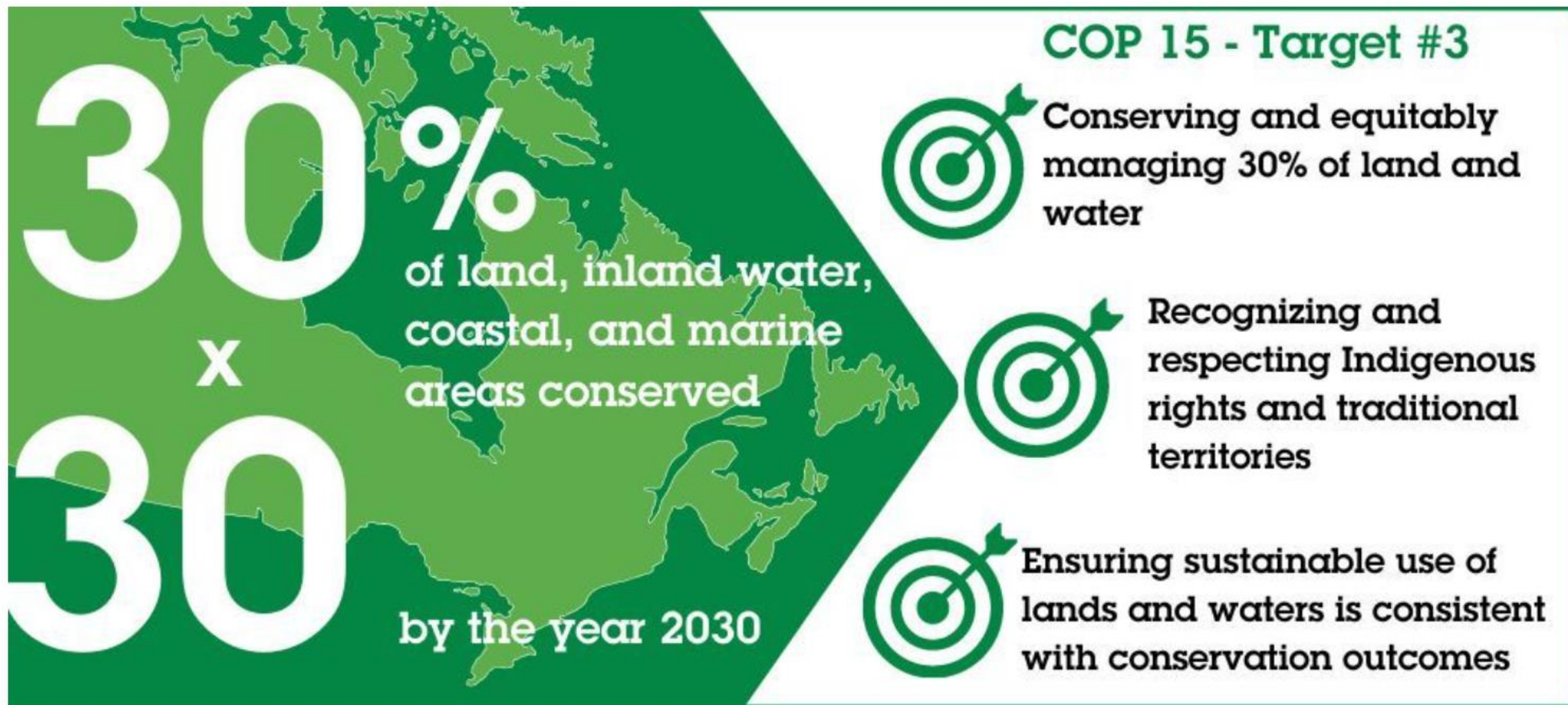
An aerial photograph of a forest lake, showing a dense green forest surrounding a dark blue body of water. The forest is composed of various types of trees, and the water reflects the surrounding greenery.

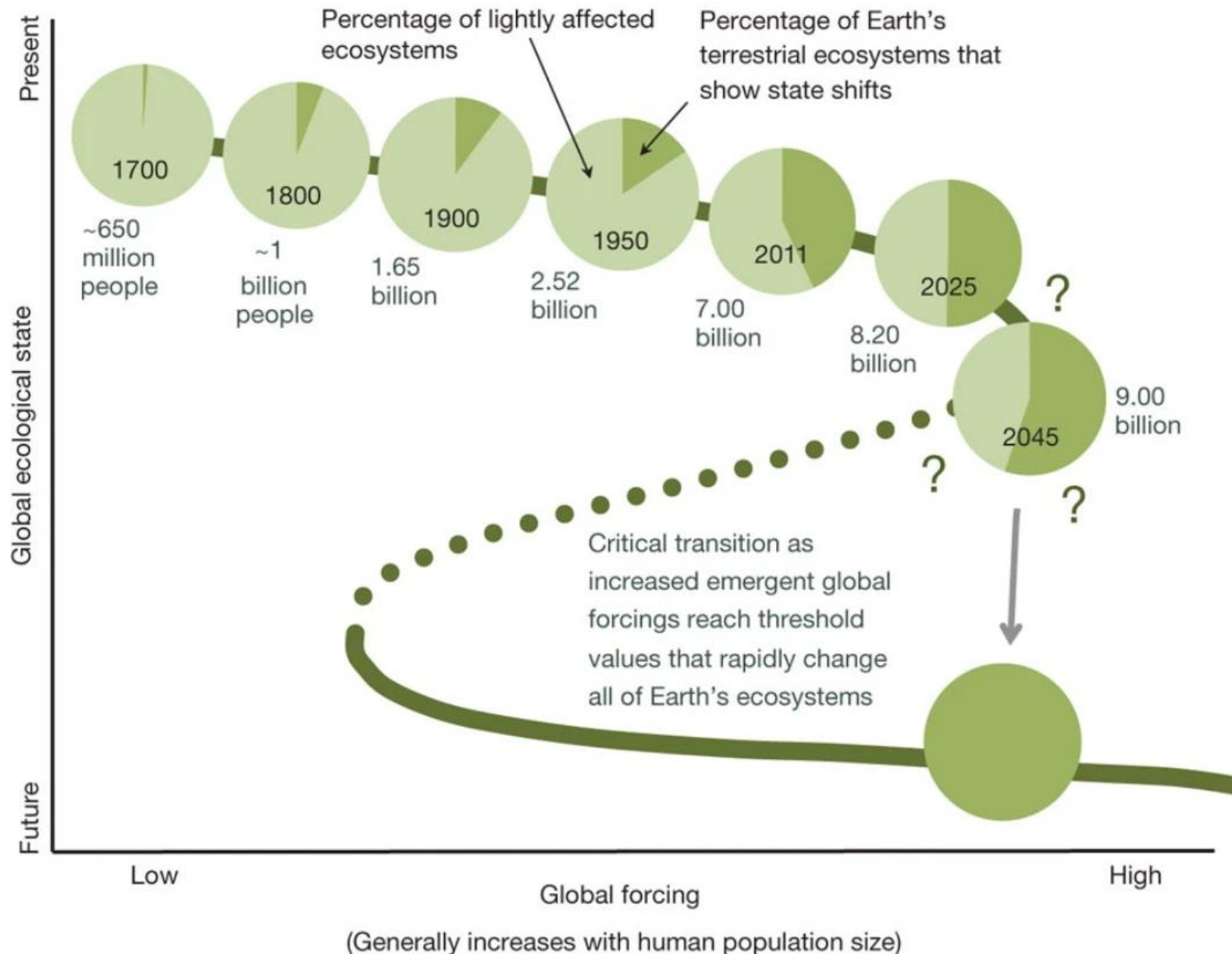
Biodiversity targets can cause significant land use demands

Kunming-Montreal: www.cbd.int/gbf



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Ecosystems are shifting towards critical transition

Barnosky, A., Hadly, E., Bascompte, J. et al. 2012. Approaching a state shift in Earth's biosphere. *Nature* 486, 52–58. <https://doi.org/10.1038/nature11018>

Site selection for wind and solar power installations – meeting all goals and needs



Human perspective

- Maintaining healthy environment
- Preference for remote sites due to “Not in my backyard” attitude



Synergies

- Ecotourism
- Recreational value of nature
- Preserving ecosystem services
- Indigenous rights
- Clean energy production



Nature values

- Long term and cumulative impacts are not yet studied
- Protecting habitats and ensuring connectivity and good quality habitats
- Maintaining and increasing carbon stocks
- Protecting last wilderness areas



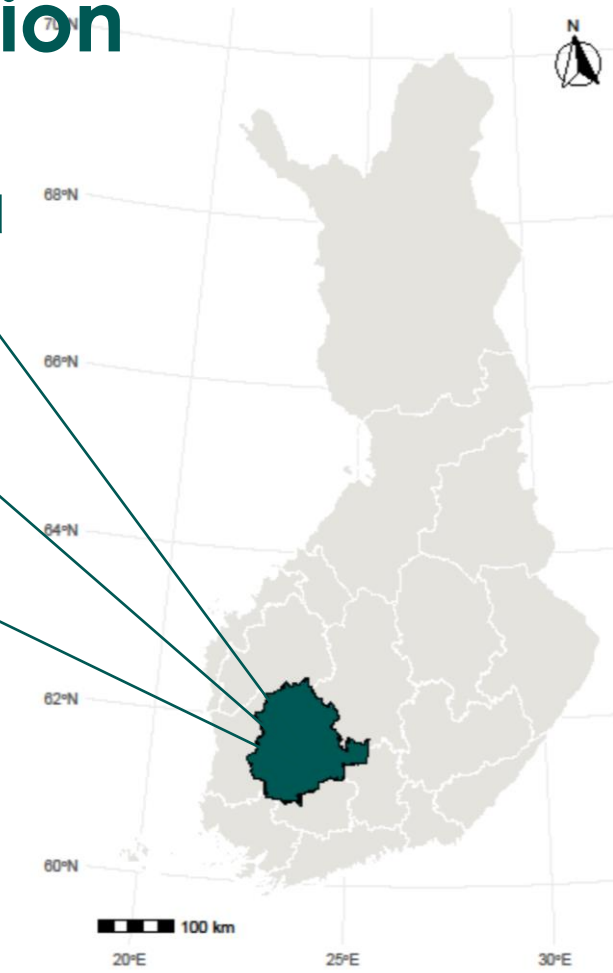
Negative impacts

Landscape values
Noise

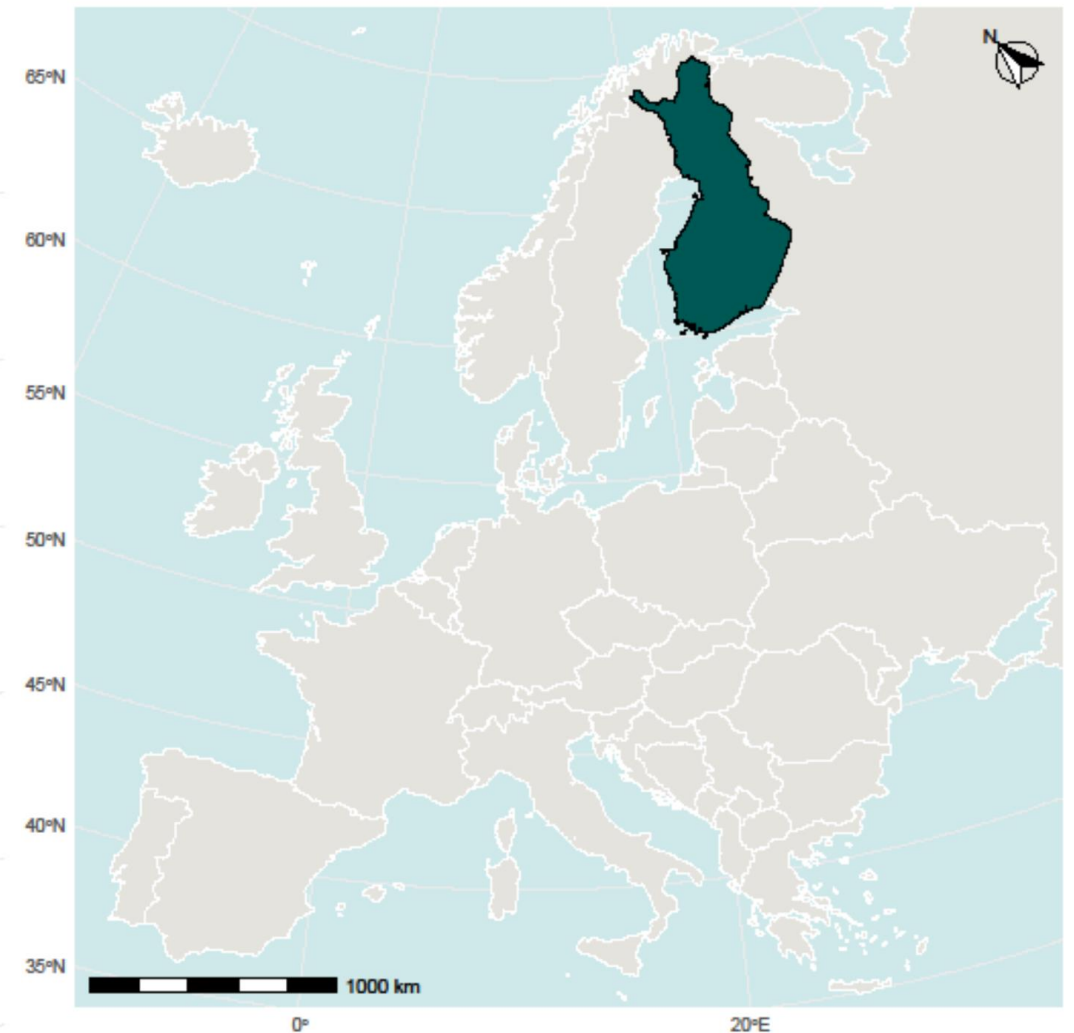
Example of wind (and solar) projects from Finland: Pirkanmaa region

- 13 small scale wind and solar energy projects installed
- 5 under construction
- 16 large scale power plants planned

Excellent and detailed biodiversity information is available



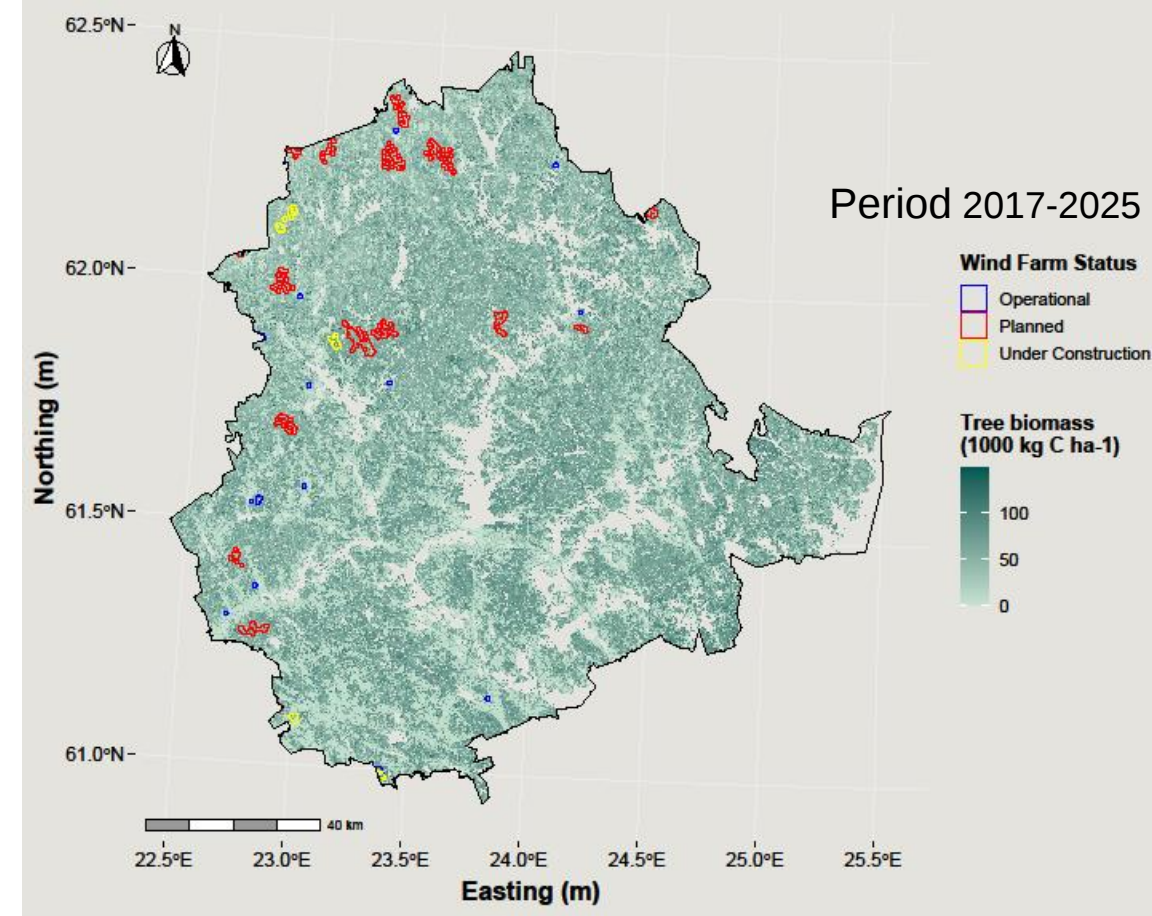
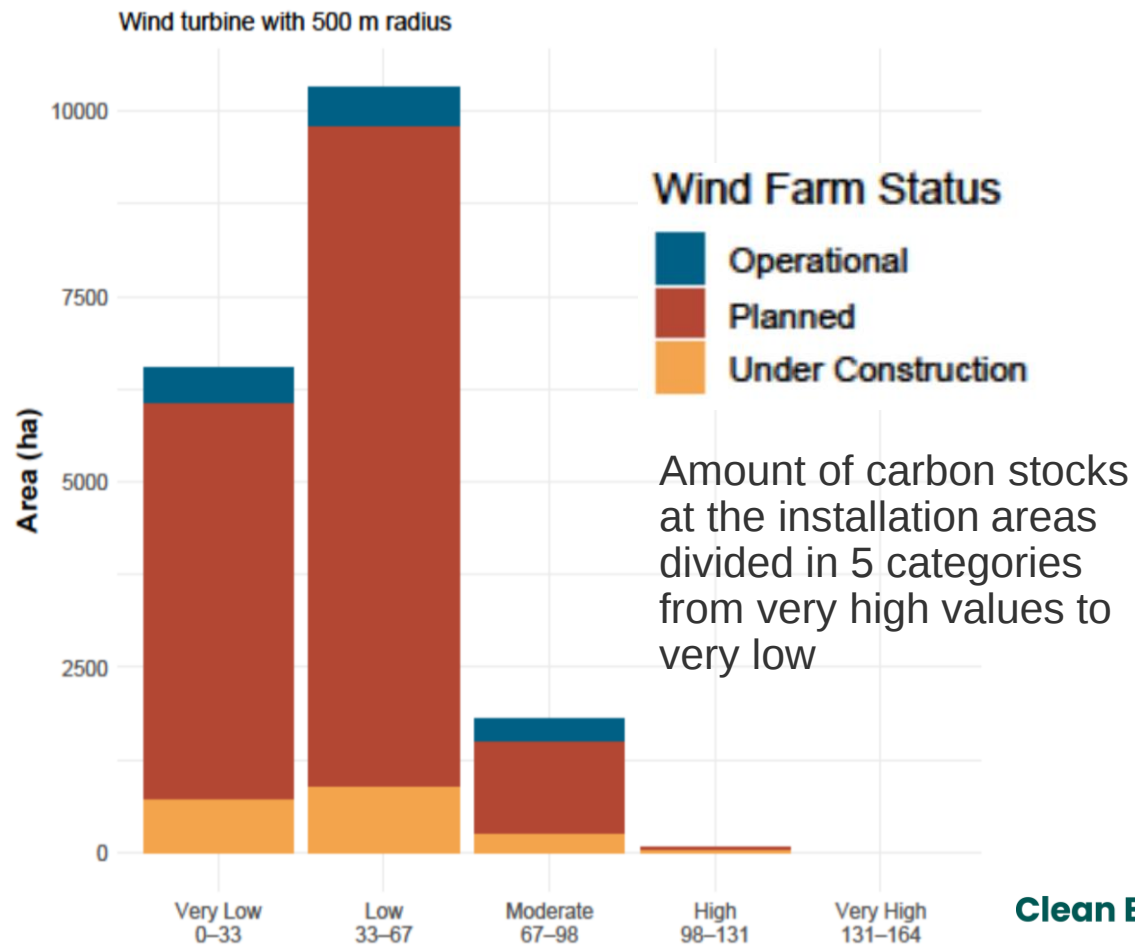
Finland in Europe
Lambert Azimuthal Equal Area projection



Data: Natural Earth

Carbon stocks in Pirkanmaa

PREBAS –Models tree growth and carbon mass

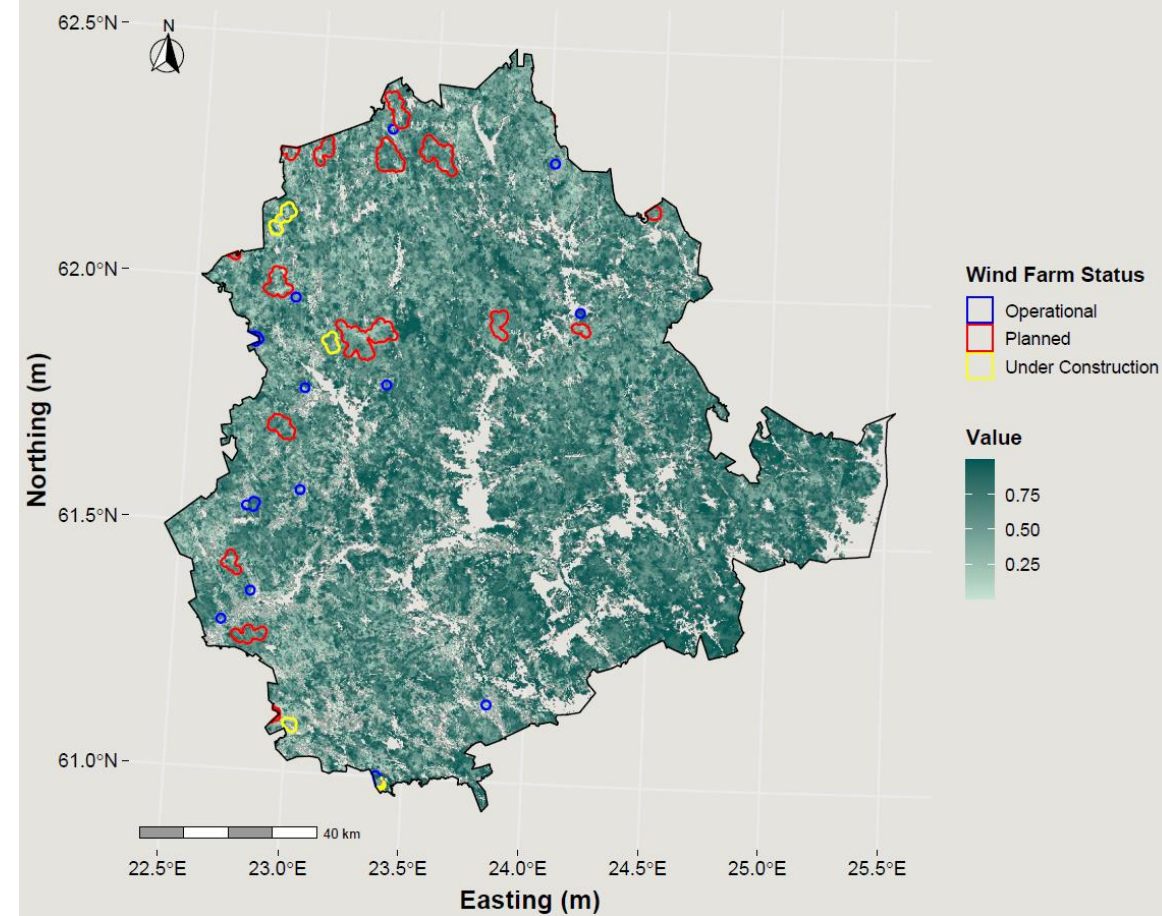
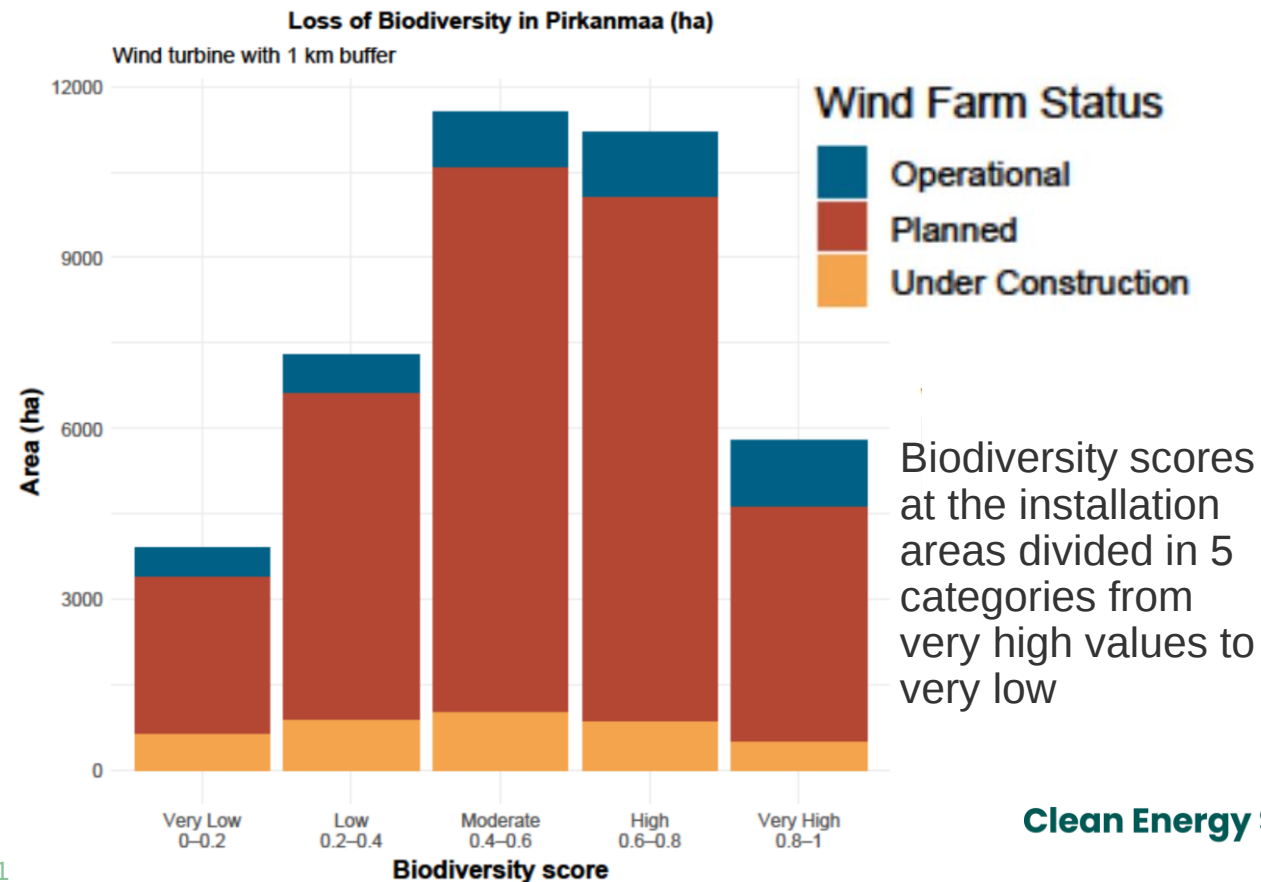


Total carbon stock loss by wind farm status:

Operational	2,596,609 kg C
Planned	16,934,360 kg C
Under Construction	1,837,650 kg C

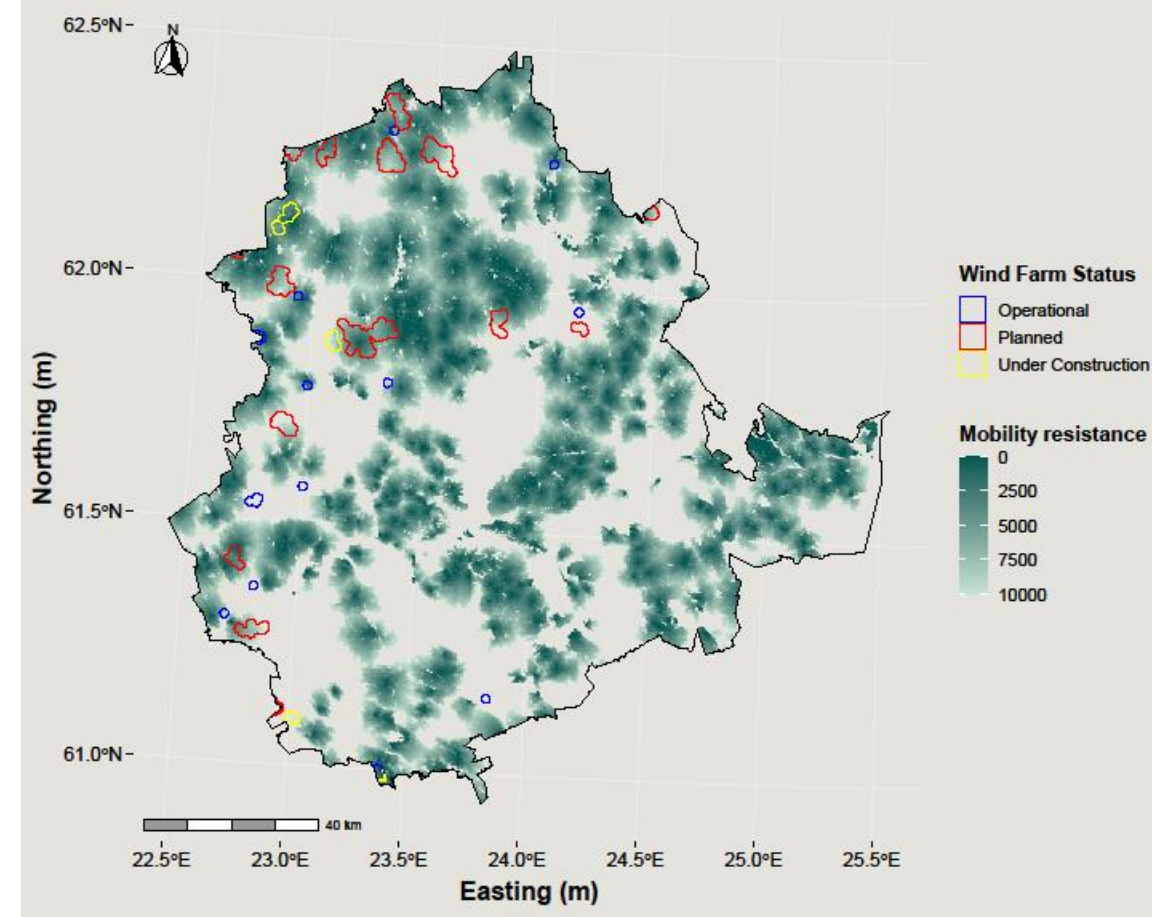
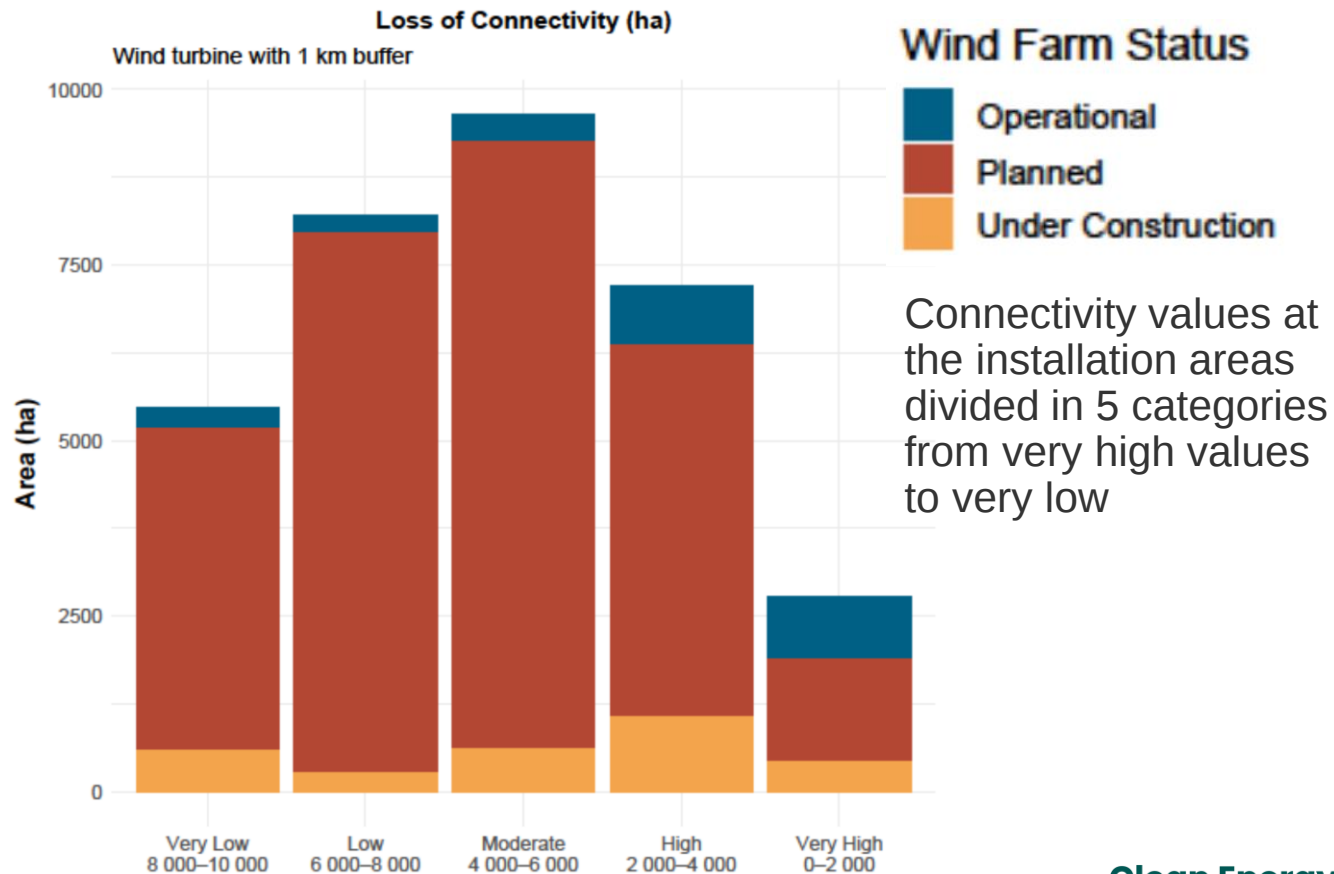
Biodiversity hotspots in Pirkanmaa

Biodiversity hotspots and high priority sites for forest nature conservation



Connectivity

Forest species' ability to move between habitat patches



Total areas by wind farm status:

Operational 2,627 ha
Planned 27,686 ha
Under Construction 2,958 ha

Wilderness areas

- Renewable energy installations are typically planned away from populated areas, yet these locations often overlap with remaining wilderness areas that should be protected.
- Spatial analytical hierarchy processes (AHP) can be used to determine the most remote areas
- Distances from roads, railways, housing and population densities, airports need to be taken into account

Nature-based solutions in solar power plant installations

Northern Europe (Finland)

- Flower meadows for solar farms
- Elevating water levels in former peat extraction sites: Sphagnum moss cultivation or restoration

Desert environment (Chile)

- Fixed or tracking arrays?
- Wind corridors for energy efficiency and for the nature



Photo: Jani Aarnio / Yle

Solar power plant in Lempäälä, Finland.



Photo: Anna Suuronen

PAS II Solar Pack, Pozo Almonte, Chile. Early operational phase 2015.

Short roadmap to sustainable wind and solar energy projects



Where?

Directing projects to low biodiversity areas



Solution

Nature values included in multi-criteria site selection



Where else?

Cumulative impacts of individual renewable energy projects



Solution

Include cumulative impacts of all renewable energy projects in environmental impact assessments



How?

What technology would support local biodiversity?



Solution

Ecological offsetting and nature-based solutions

We build hope through research



Finnish Environment Institute at Finland Pavilion at the UN COP30 climate change conference: www.syke.fi/en/cop30



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Next: Commentary speeches

Izabella Teixeira

Co-chair of the International Resource Panel (IRP)
for the UN Environment Programme

Kaisa Mustajärvi

Development manager, City of Tampere
Professor of practice, University of Jyväskylä.

Thank you for your attention!



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