Estonia Latvia Programme
Linking Estonia and Latvia
European Union
Part-financed by the European Regional Development Fund

KIK
KESKKONNAINVESTEERINGUTE KESKUS

GORWIND

Advisory Board Meeting

People's opinions on the project Status, preliminary results and next steps in WP4

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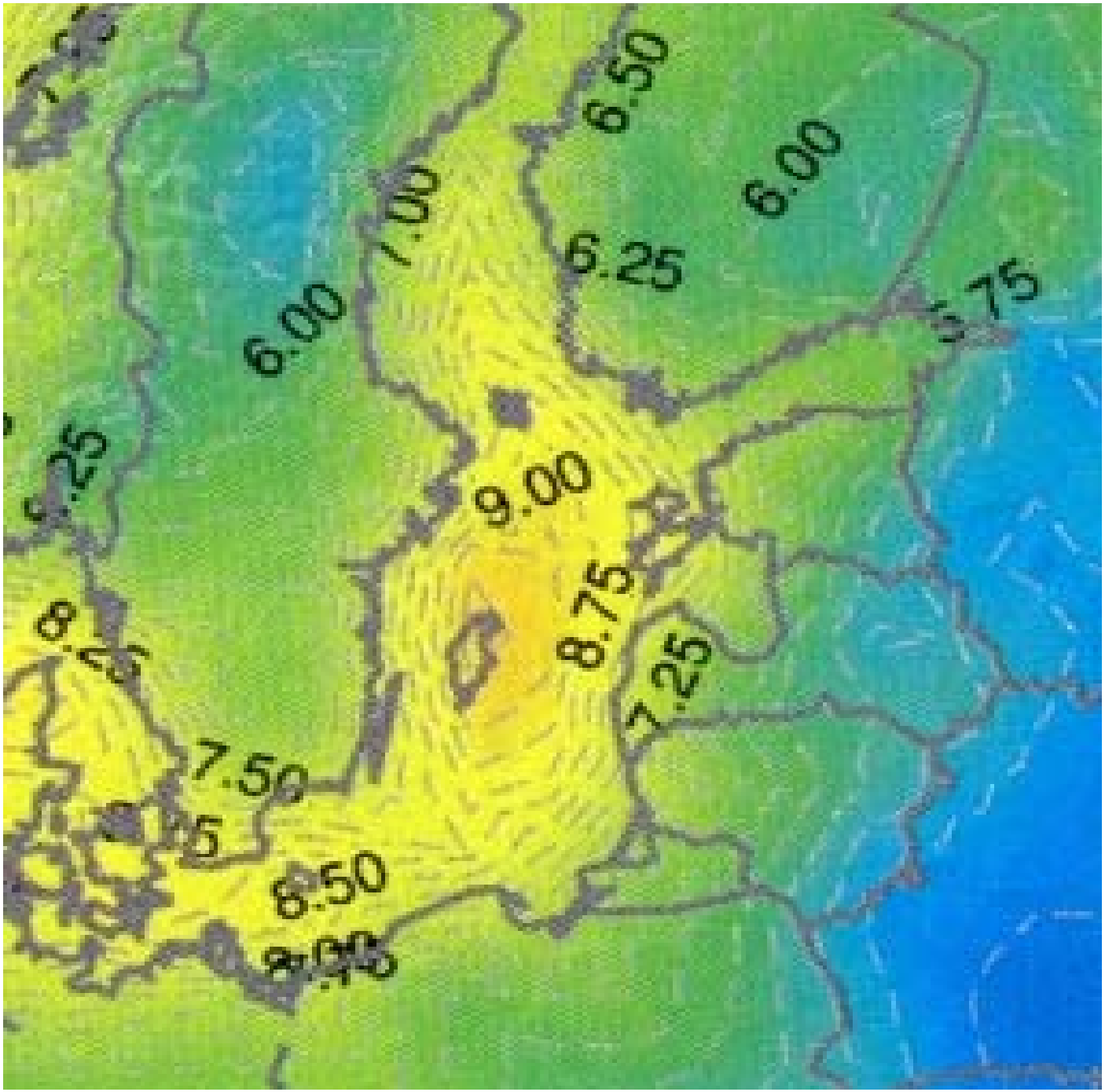
TARTU ÜLIKOOL 1632 UNIVERSITAS TARTUENSIS

Wind resource ...



+ Natural limitations

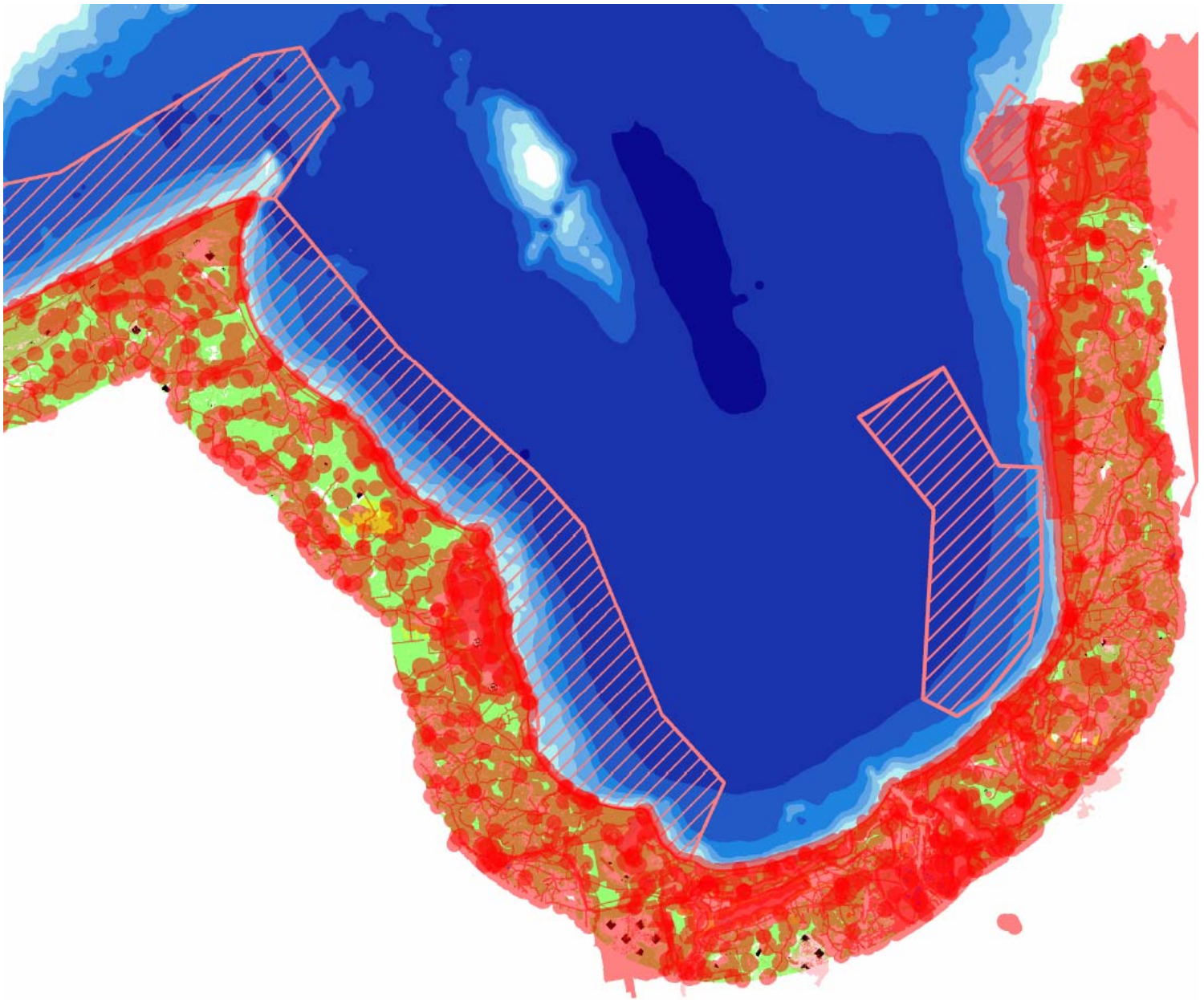
+ Legal restrictions

+ Nature protection

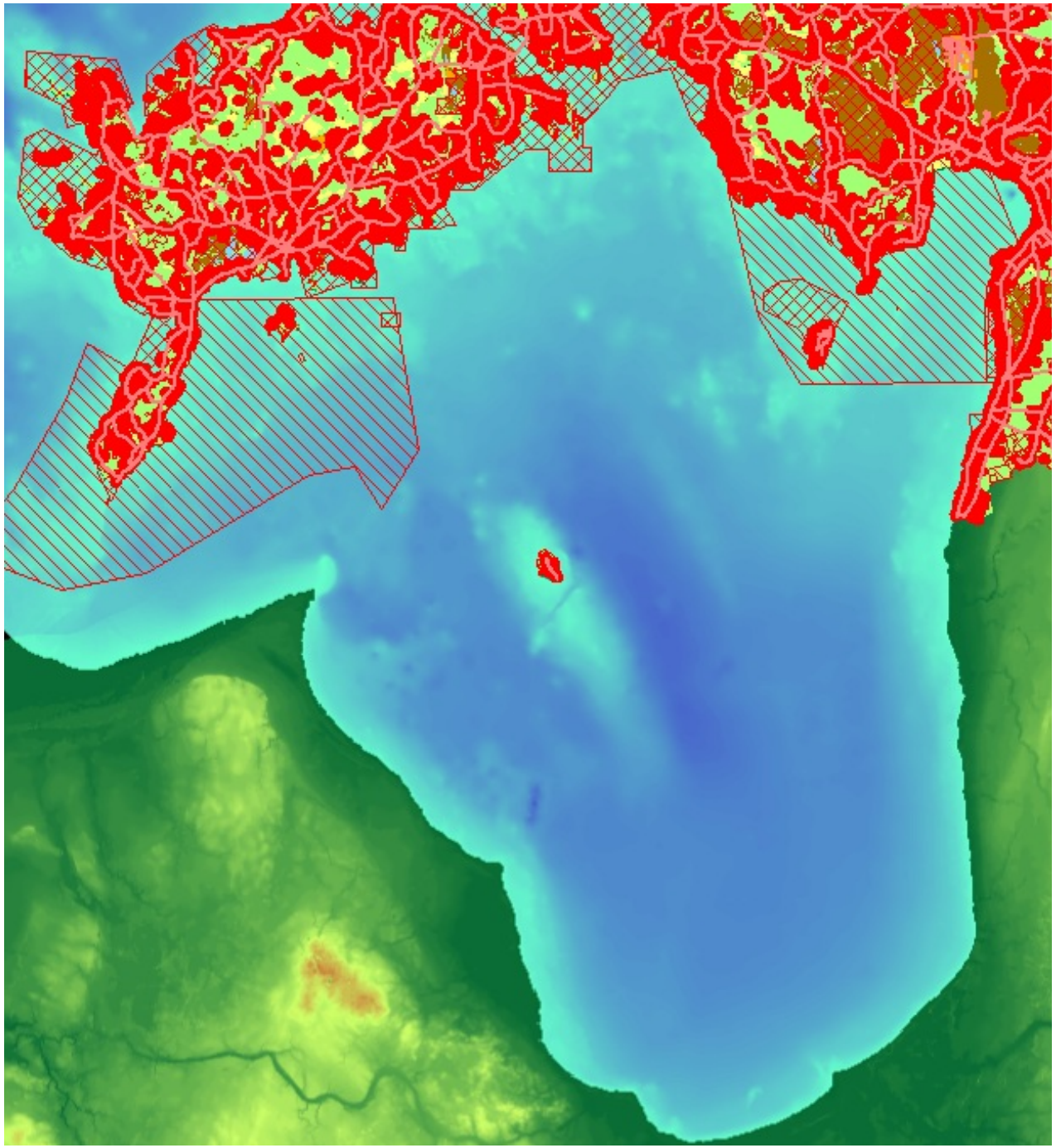
+ Socio-economical limitations

= Suitability rate

Legal restrictions on land in Latvia...

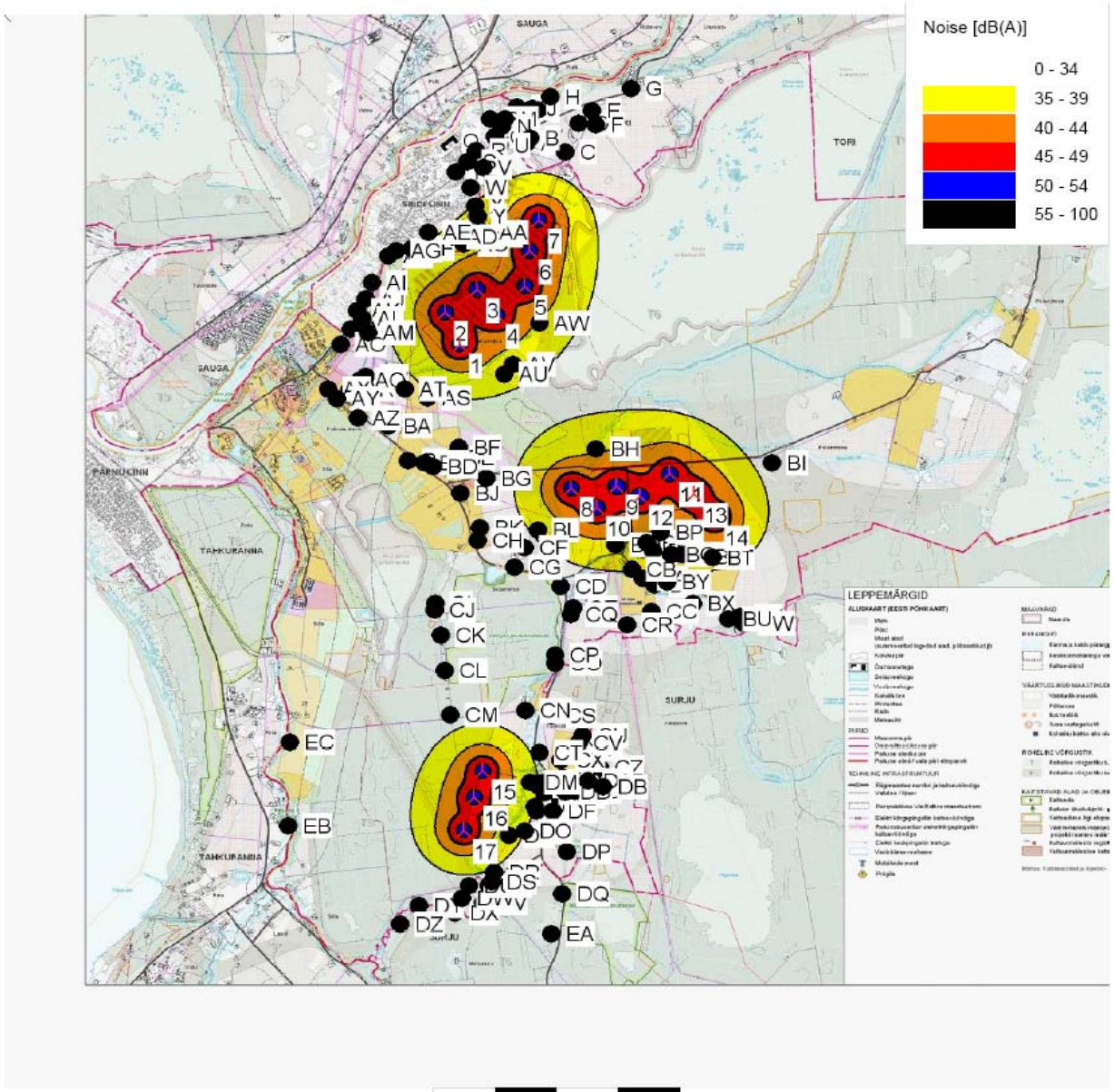


Legal restrictions on land in Estonia



Almost no space for wind farm development in coastal zone, only few stand-alone wind turbine sites available

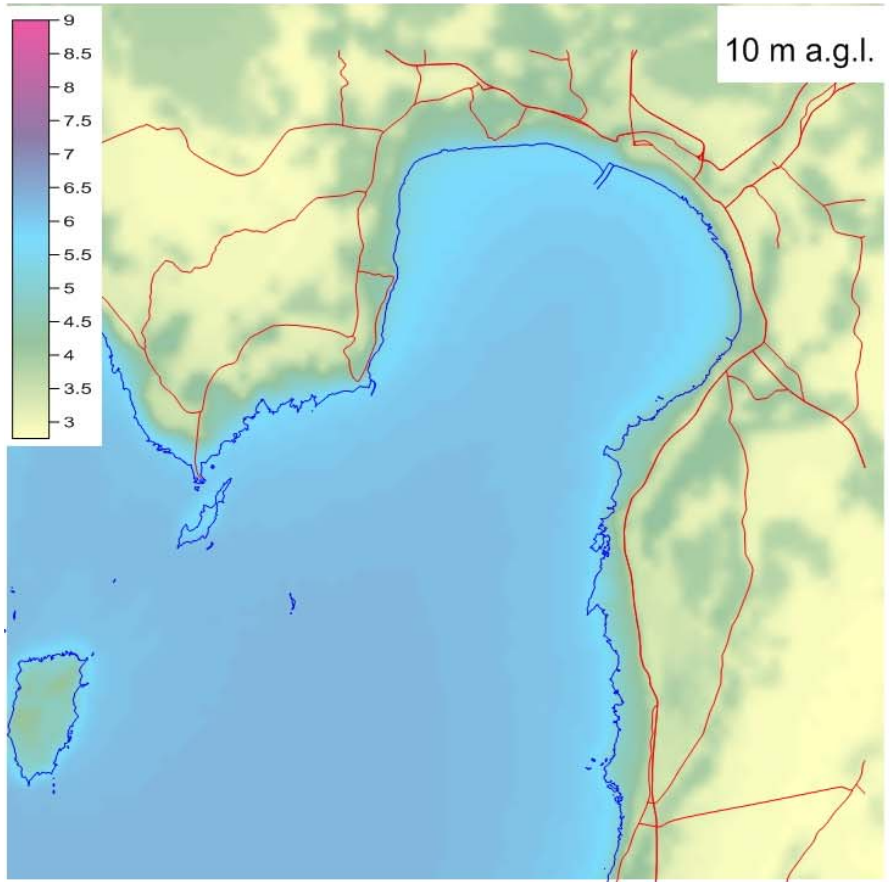
Noise level around wind farms

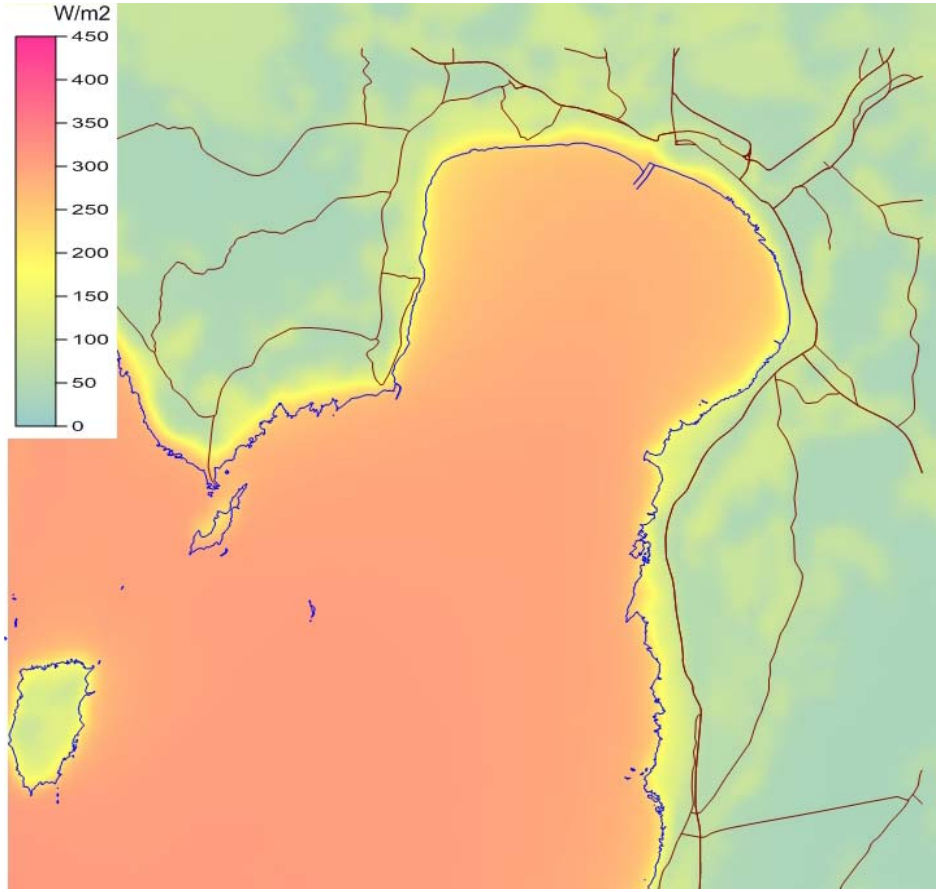


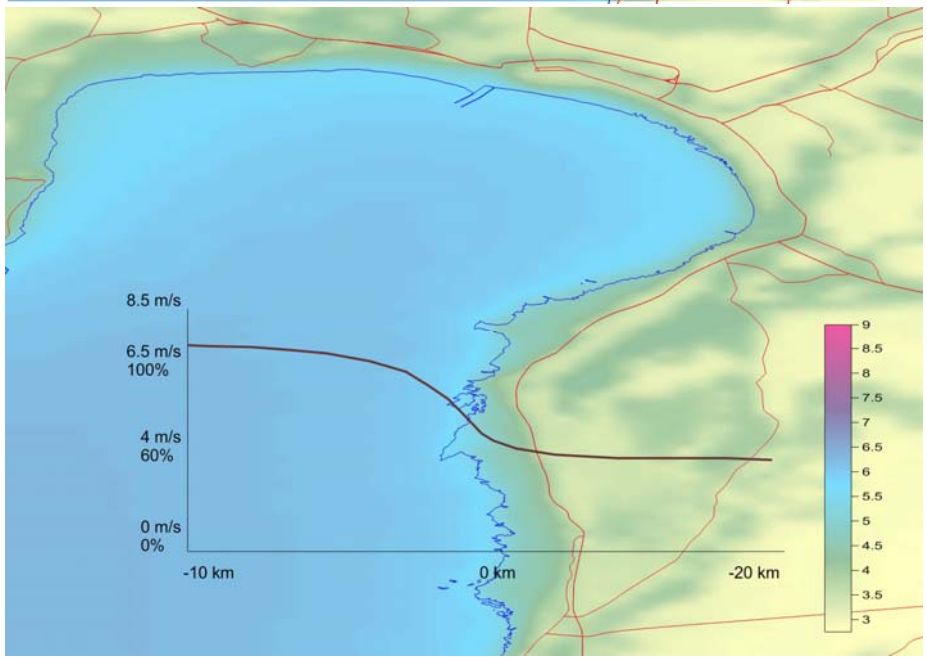
Until April 4. 2011 noise level regulations were similar in EST and LAT.

As a good practice it was to quarantee 40 dB(A) or lower noise level, now the level is defined individually by each local government and it can be 50% stricter than normative level.

In offshore wind farms higher number of days with inversion is characteristic and thuse noise propagation is increased.







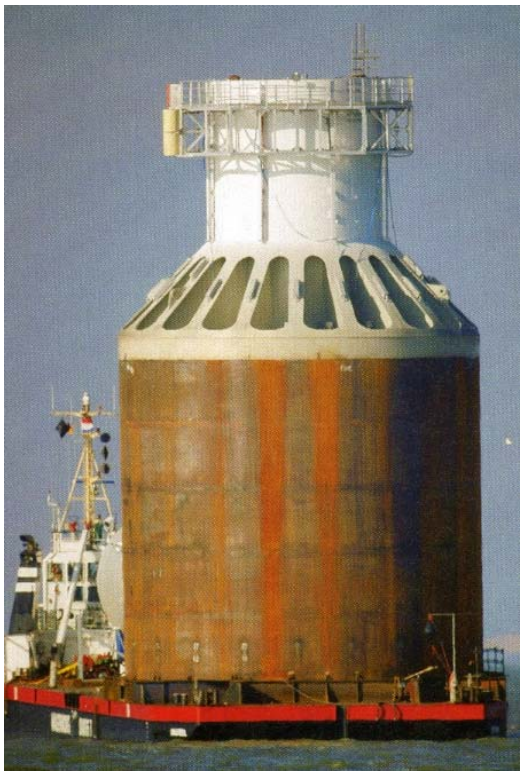
Wind energy in off-shore is nearly 40% higher than on coast but...

Distance to the power grid connection point

Current situation

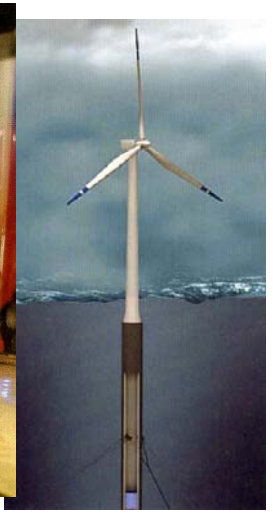
Prospektiv

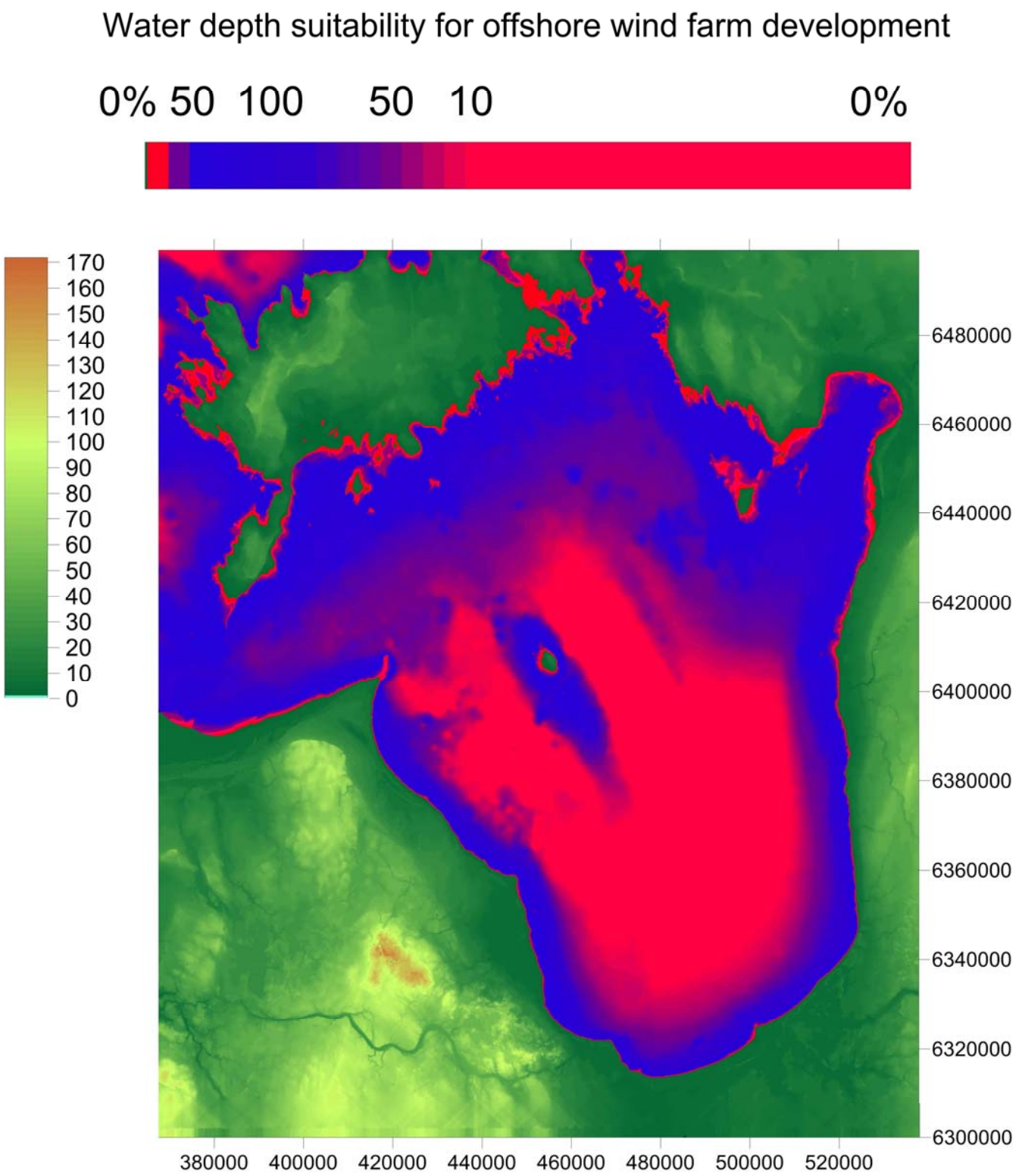
Water depth (5-30 m)

- Currently maximum depth for off-shore wind turbine with fixed foundation < 45 m *(Beatrice, UK);*
- Floating wind turbine test-model in 220m *(Hywind, NOR)*

... but not in ice conditions like in Gulf of Riga



Water depth is one of the most critical limitations:

very shallow water <1.5 m is not accessible for installation ships and barges;

deeper than 35 m water is too costly to develop, especially in ice-covered waterbodies.

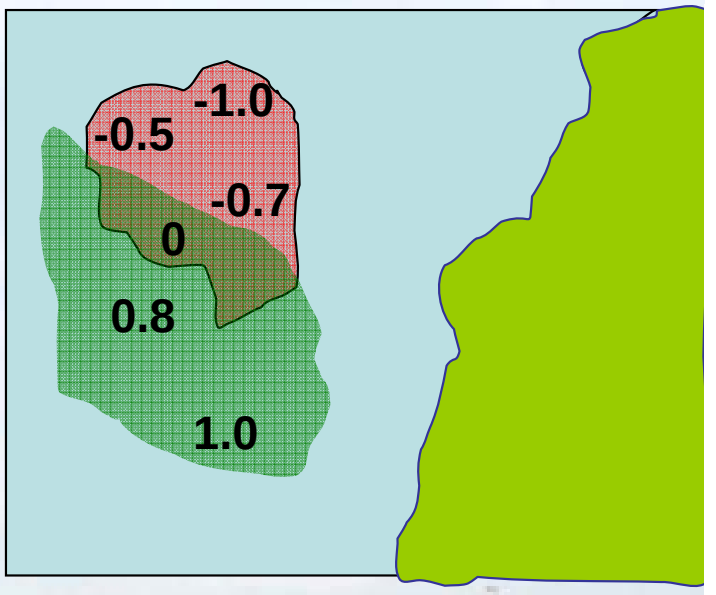
- **How far should be the wind farm?**
- **How big can be the wind farm?**
- **In which landscape do we accept the wind farm?**

Wind turbines at

5 km distance

Vestas V-80 (2MW)

- Questionnaire:
  - how far is acceptable?
  - how many is acceptable?
  - where is acceptable?



- Probability (acceptability) mapping
  - Areas not accepted by local inhabitants
  - Areas accepted by local inhabitants

Visualization

a) Local (coastal and marine) landscape types defined in Latvia and Estonia;

b) Visualization of wind farms in specific landscapes;

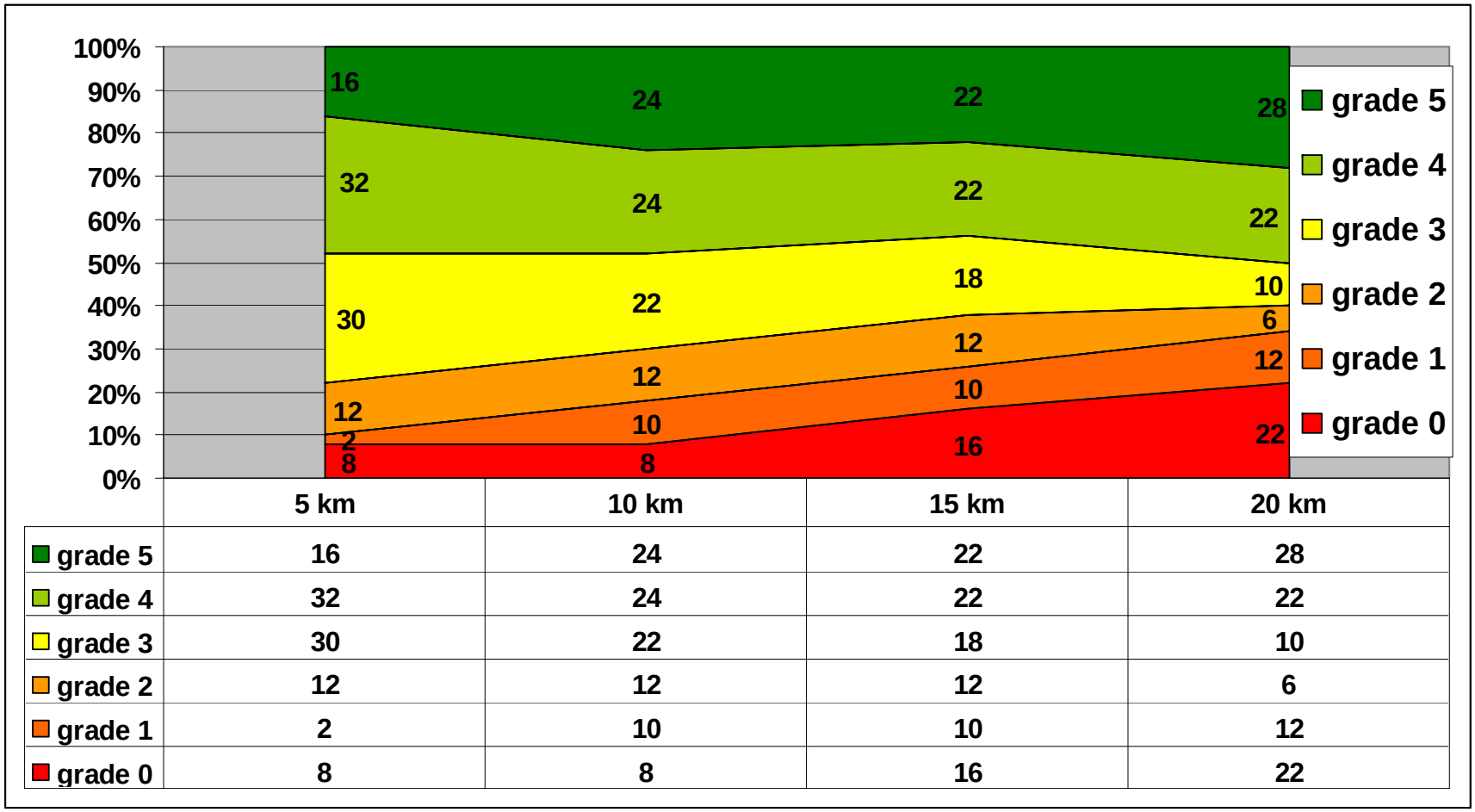
Distance from wind farm;

Size of wind farm;

Landscape of wind farm area

Visualization

5km → 20km



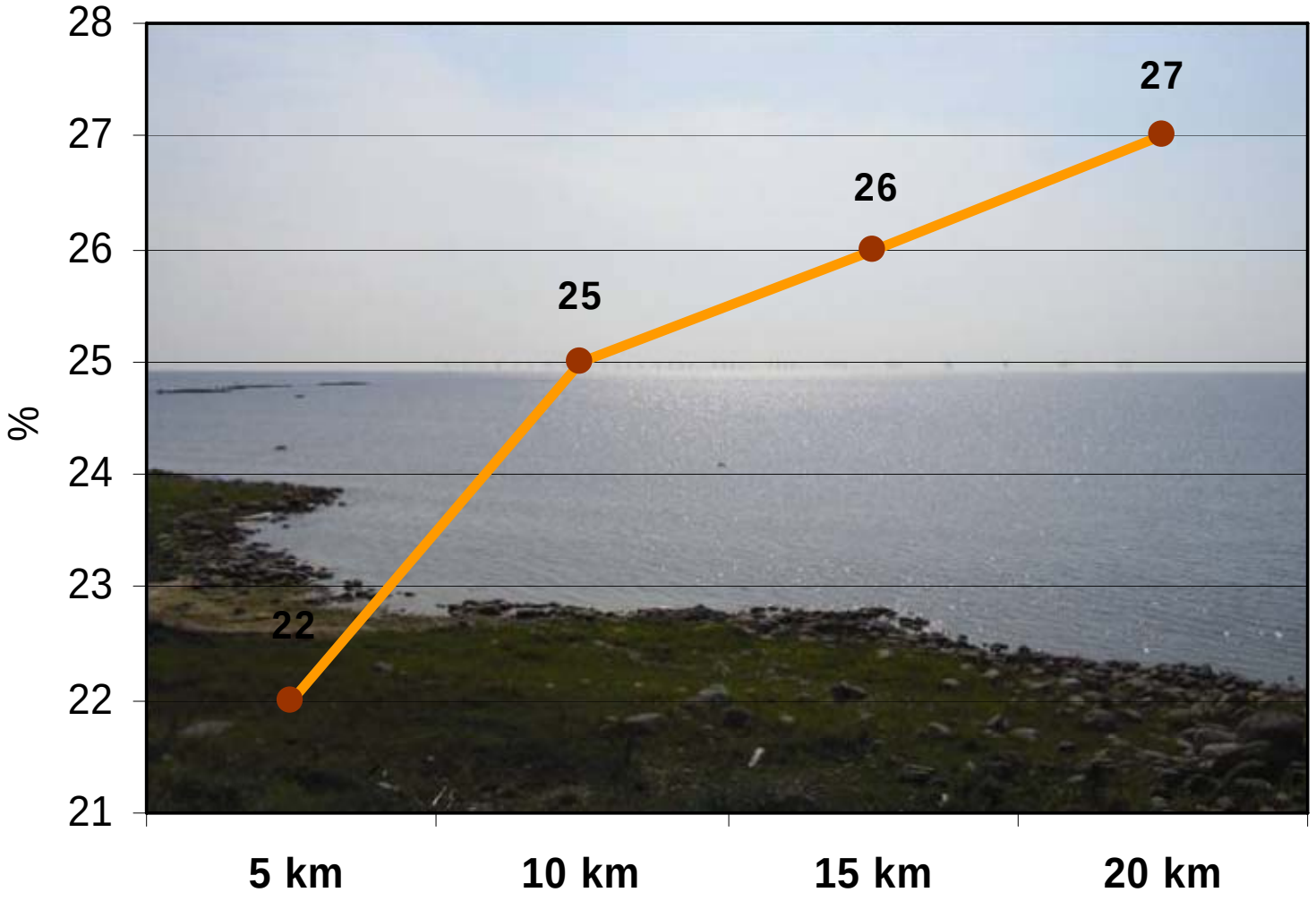
	5 km	10 km	15 km	20 km
grade 5	16	24	22	28
grade 4	32	24	22	22
grade 3	30	22	18	10
grade 2	12	12	12	6
grade 1	2	10	10	12
grade 0	8	8	16	22

Very much

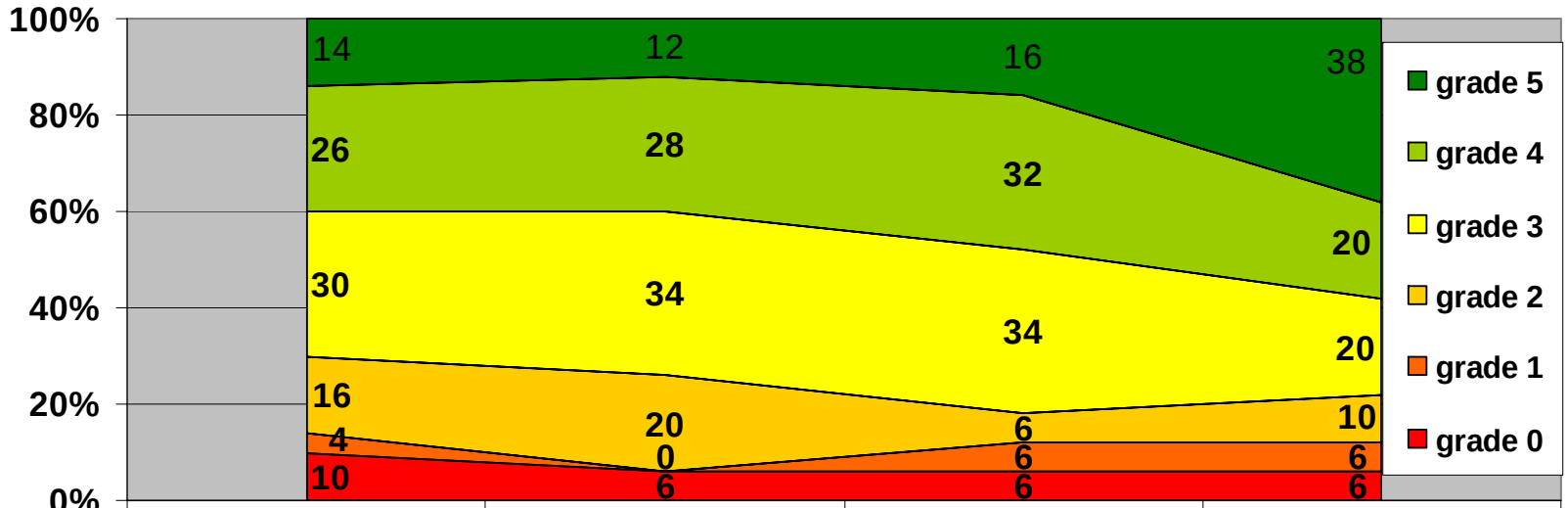
Not at all

How far off-shore should go?

Share of people totally agree with specified distance of off-shore wind farm in Latvia



24 → 3 turbines



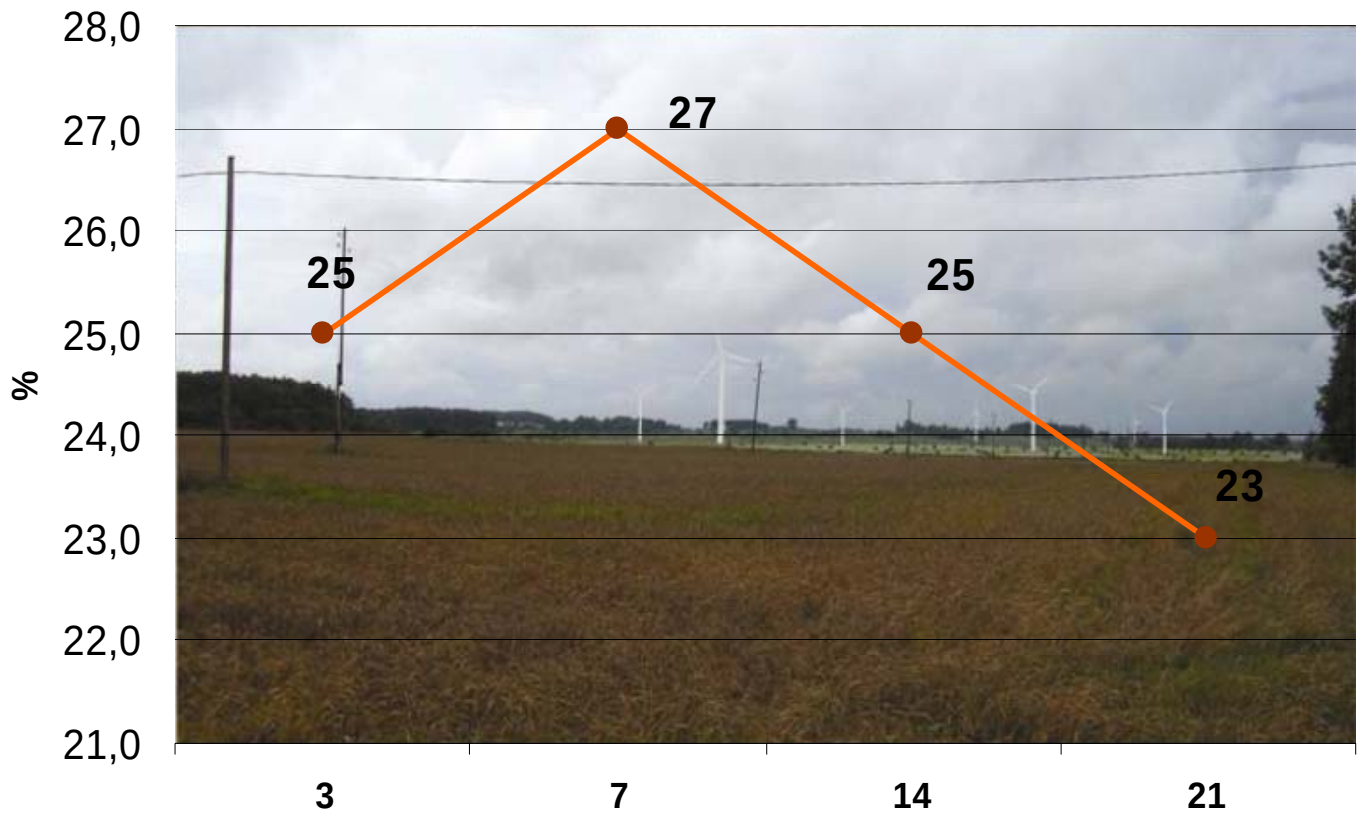
	24 turbines	14 turbines	7 turbines	3 turbines
grade 5	14	12	16	38
grade 4	26	28	32	20
grade 3	30	34	34	20
grade 2	16	20	6	10
grade 1	4	0	6	6
grade 0	10	6	6	6

Very much

Not at all

How many wind turbines?

Optimal size of wind park

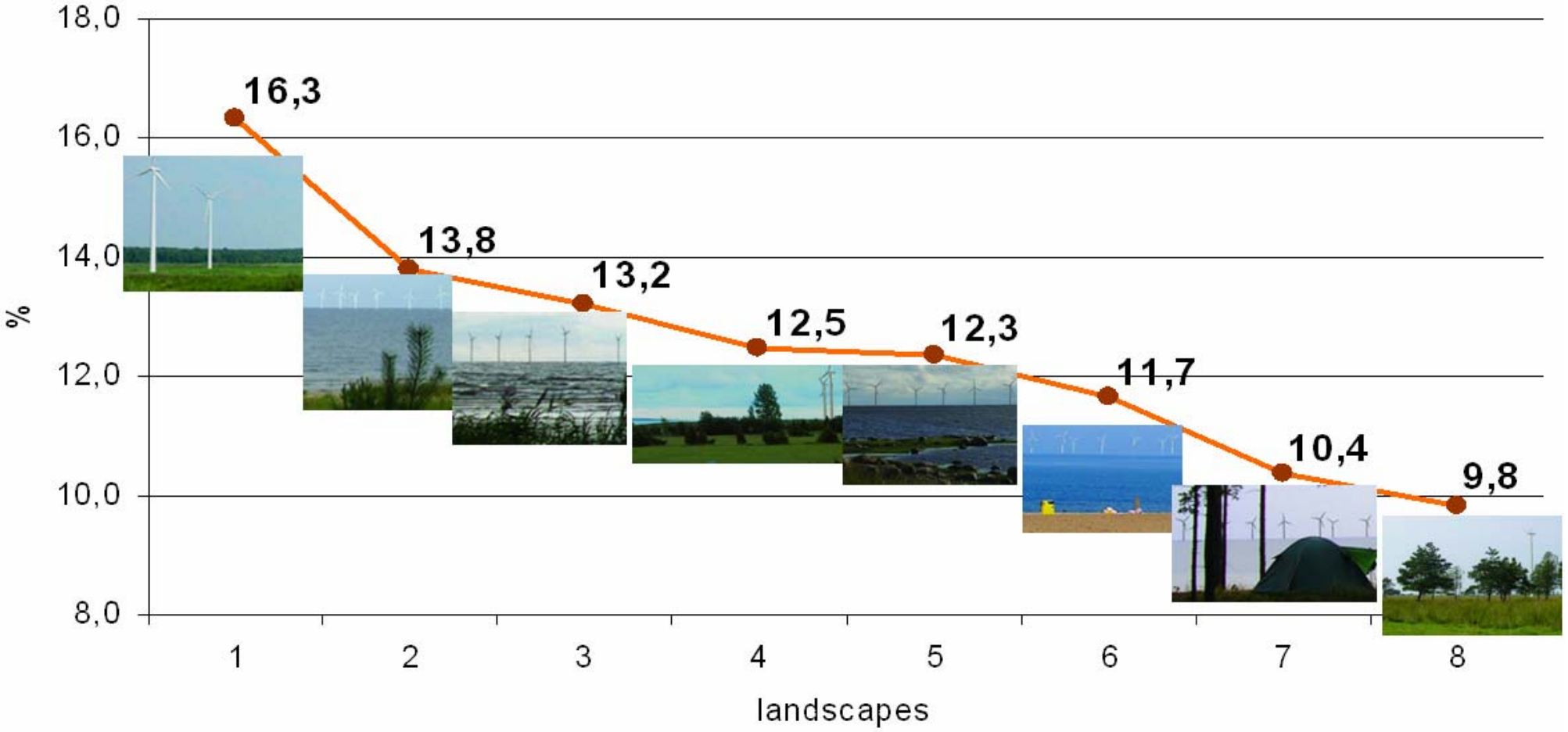


Not at all

47	19.50%	31	12.76%	0	40	16.74%	57	23.65%
18	7.47%	24	9.88%	1	15	6.28%	20	8.30%
25	10.37%	32	13.17%	2	32	13.39%	30	12.45%
50	20.75%	52	21.40%	3	56	23.43%	39	16.18%
39	16.18%	52	21.40%	4	50	20.92%	36	14.94%
62	25.73%	52	21.40%	5	46	19.25%	59	24.48%

Very much

The most suitable lanscape for wind parks



Landscape preferences

	Estonia	Latvia
0	8 %	32 %
1	14 %	15 %
2	16 %	8 %
3	28 %	17 %
4	24 %	15 %
5	10 %	15 %

	Estonia	Latvia
0	4 %	19 %
1	8 %	10%
2	6 %	12 %
3	36 %	21 %
4	26 %	19%
5	20 %	18%

Landscape preferences

	Estonia	Latvia
0	2 %	6 %
1	4 %	6 %
2	0 %	10 %
3	36 %	16 %
4	46 %	29 %
5	12 %	31 %

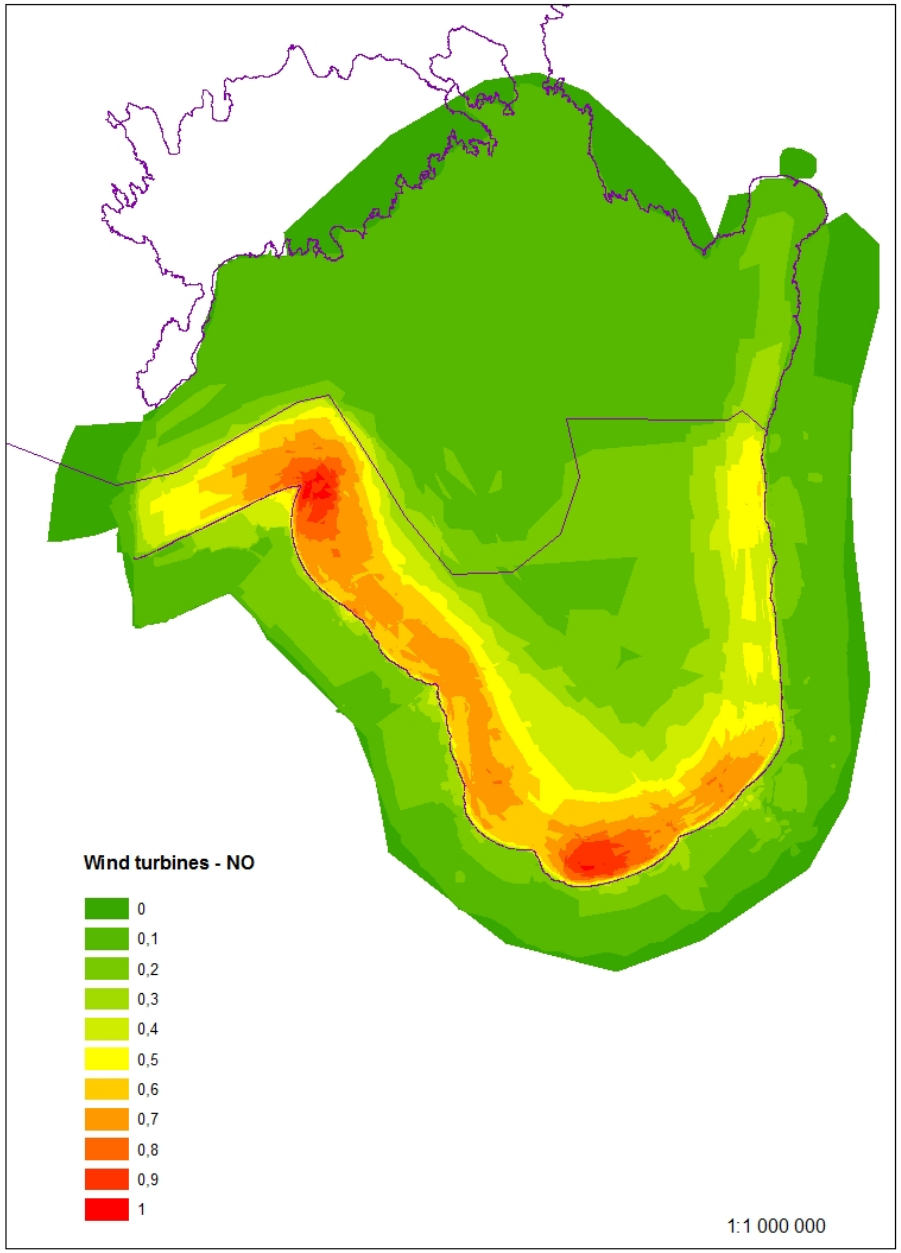
	Estonia	Latvia
0	10 %	27 %
1	8 %	11%
2	14 %	15 %
3	28 %	21 %
4	24 %	12%
5	16 %	15%

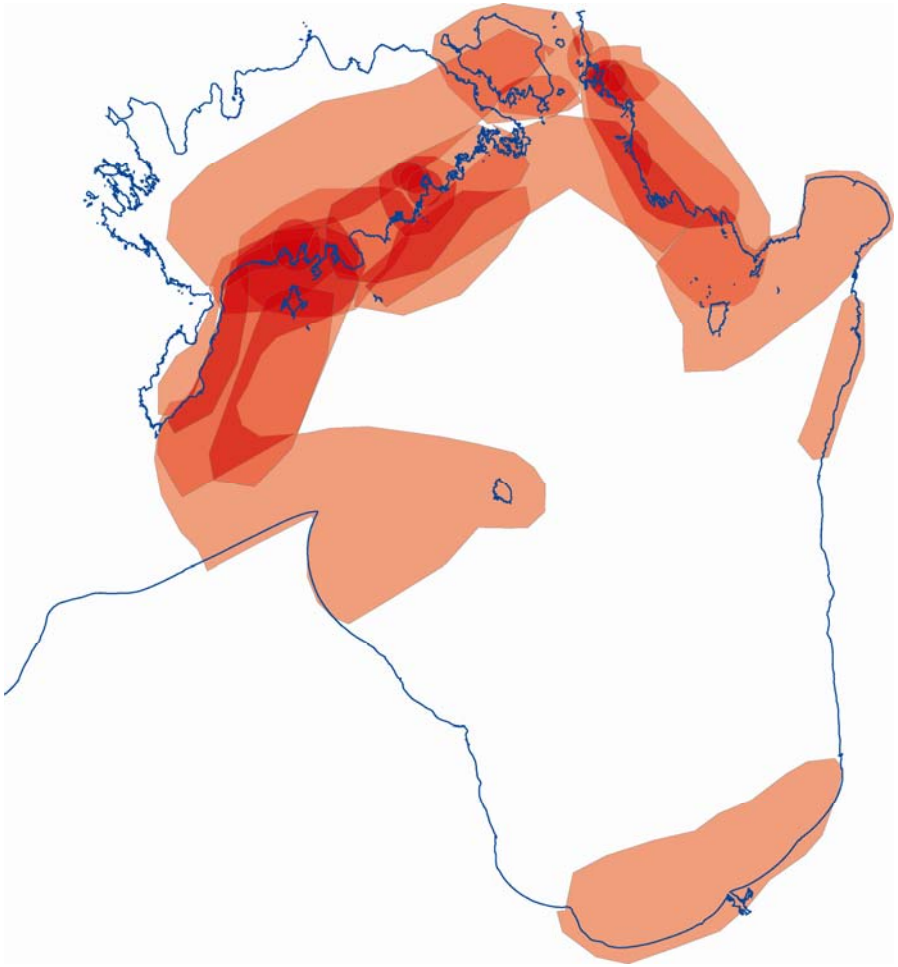
Landscape preferences

	Estonia	Latvia
0	14 %	25 %
1	16 %	9 %
2	14 %	10 %
3	24 %	20 %
4	20 %	17 %
5	12 %	19 %

	Estonia	Latvia
0	6 %	18 %
1	10 %	7%
2	6 %	11 %
3	30 %	23 %
4	30 %	19%
5	18 %	21%

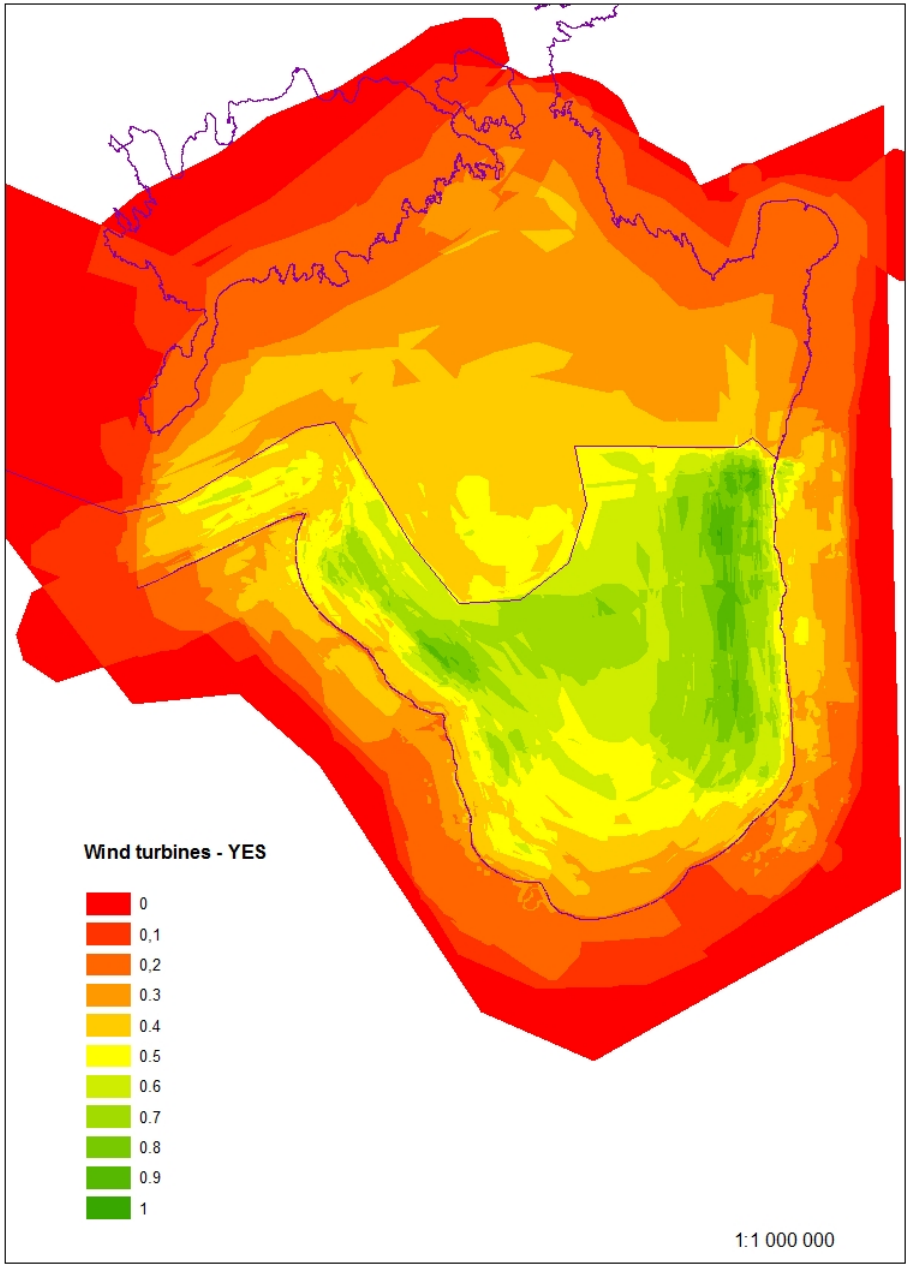
Public rejectance to offshore development

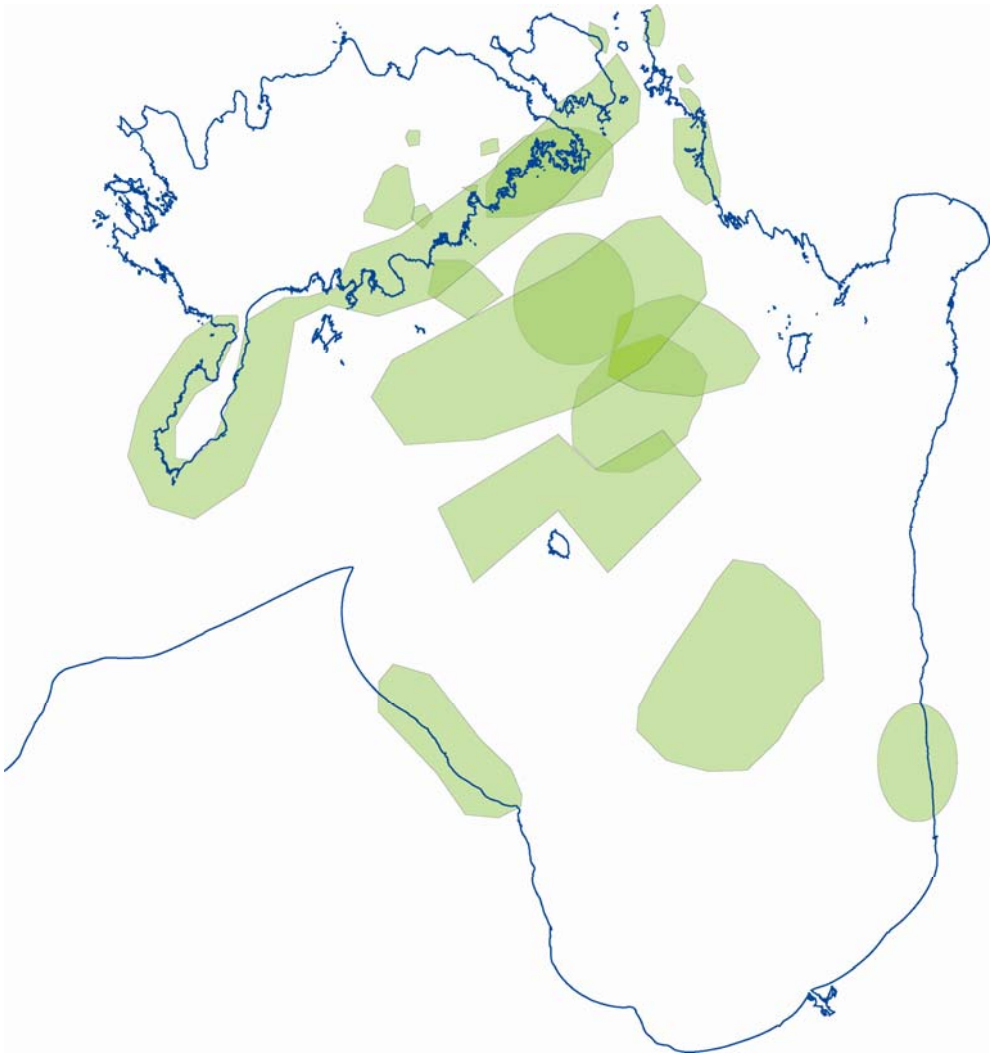




Examples of areas of public rejectance based on questionnaires

Public acceptance to offshore development





Examples of areas of public acceptance based on questionnaires

Other aspects on wind energy

Willingness to pay for wind energy:

No: 84%

Yes: 16%

Should government support wind energy:

No: 24%

Yes: 76%

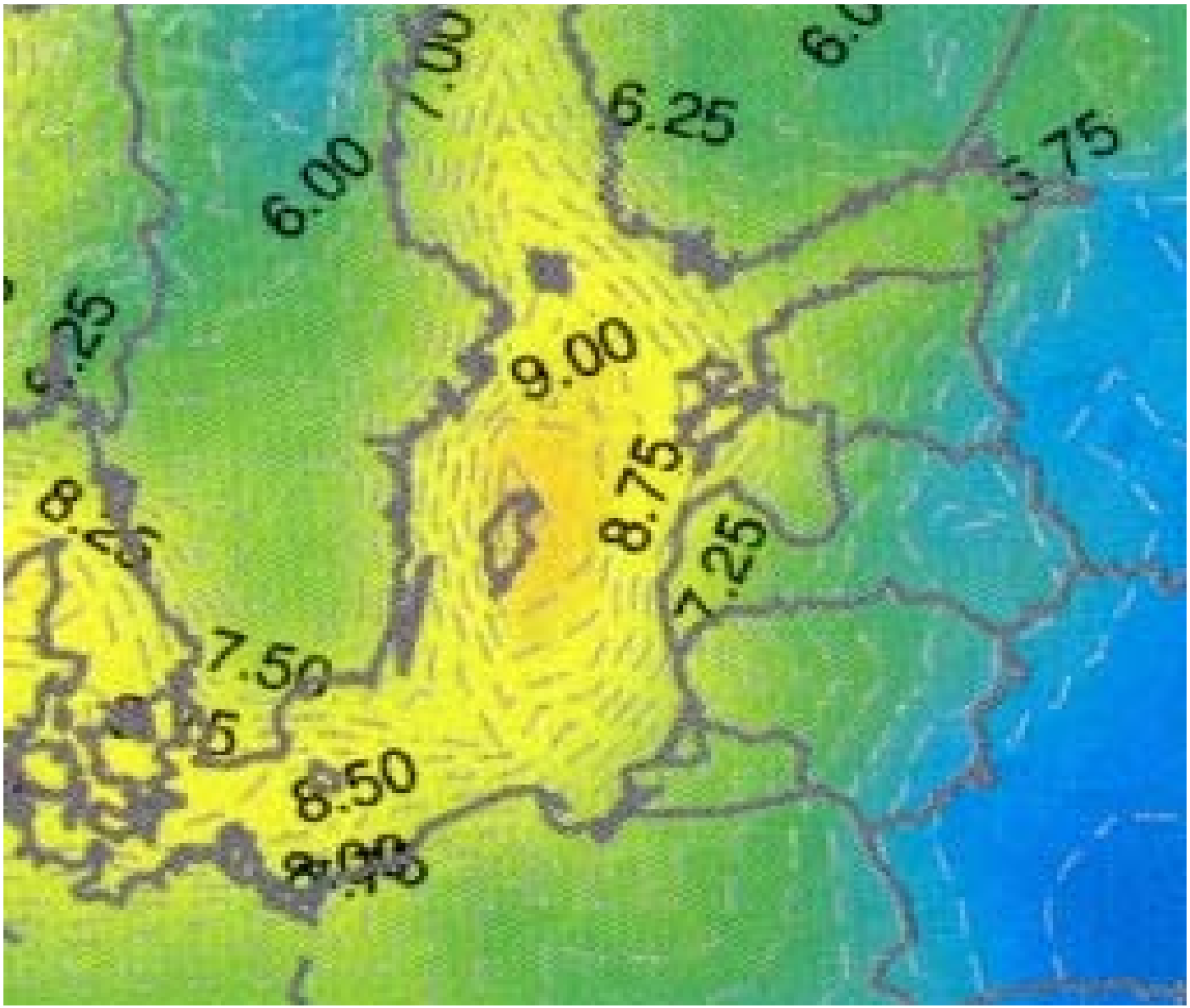
NIMBY: 41% have some degree of syndrome, it is more present among younger people.

What makes people to accept wind turbines?

Free electricity for neighbouring people (84%) but also 46% require compensation for local government

Next step --->

data syntesis and GIS analysis



Wind resource ...

+ Natural limitations

+ Legal restrictions

+ Nature protection

+ Socio-economical limitations

= Suitability rate

On-line questionnaires

- In Estonian:

  http://kwiksurveys.com?u=arvamusuuring
- In Latvian:
- http://www.kwiksurveys.com?s=OKKNML_6c433347
- In English:

  http://kwiksurveys.com?u=TTinEnglish