

# Safety standards of urban turbines

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# Practical experience

- Negative perception of urban turbines at most important stakeholders
- Most frequently mentioned aspects:
  - Neighborhood: flicker, shadowing, breakage of the blades, decrease of the value of the houses
  - Local authorities: safety, spatial planning
- Consequences: long permit procedures, projects are not accepted

# Possible solutions

Standards and Certification?

Complicated: combination of criteria regarding wind and built surroundings

Expensive: producers can not pay for it

National, European, international?

# Existing technical standards (1)

- IEC61400-2, edition 2 (2006), for HAT turbines <math><200\text{ m}^2</math> swept area, <math><1000\text{ V AC}</math> or <math>1500\text{ V DC}</math>
- Scope: quality of engineering, design, operation, maintenance...
- Including a paragraph about a static and dynamic loads
- IEC61400-22 sound production standard

# Existing technical standards (2)

- Safety of the neighbourhood is not included
- There are no clear criteria regarding risks for the neighbourhood
- Specific building issues are not consistent in Europe
- Development of international standards takes at least 3 years
- Probably better on European level because international would not get enough interest

# Building requirements

- NEN6702, Dutch building standard. The requirements differ from IEC 61400-2
- In this standard the directives for dynamic load are proscribed, but it is not clear if the requirements are sufficient

# References

- Antennas, lifts, large ventilators and other installation on roofs of buildings (maintenance installer, visitors, tenants) can be used as a reference

# Conclusions

- Combination of wind turbine standards and the building standards needed
- Learn from similar technologies
- Approach on European level
- Safety criteria for the neighbourhood must be defined
- In order to shorten the permit procedures, safety criteria of urban turbines should be imbedded into building requirements