

Wintegrate

Legal framework of smallbuilding-mounted wind turbines

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Context of Brussels

Few projects of building-mounted WT exist in Brussels

- A. Unstudied projects failed

- B. Brussels' legislation does not stimulate the development
 - ▶ Brussels' decree 2007 (quorum for green certificates)
 - ▶ RRU – GSV Prohibits development
 - ▶ Environmental permits are not dedicated

Goals

Our objectives for this research

A. Innoviris Platform

- ▶ Develop a report on legal and planning aspects of building-mounted wind turbines

B. Region and municipalities

- ▶ Reach out the decision-makers to develop dedicated legal framework for building-mounted wind turbines

Sources

Diversity of codes and countries



Codes of ordinances, Municipal codes, land development codes, ...

21 Counties or Towns



Planning portal, Renewable UK.

Wales, Scotland, England



Planning permit, Environmental permits, Decrees, Memorandum.

3 regions

Sources

Sample of representative cities

- Diversity in size, number of inhabitants and buildings, building height



North Kansas City

Anchorage

Los Angeles

Surface [km ²]	11	4396	1215
Altitude [m]	366	31	81
Inhabitants	4 200	300 000	4 000 000
Number of high-rises	4	19	532
Highest building [m]	58	90	310

Methodology

A. Compare the different procedures

- ▶ Permits required
- ▶ Permitted development right
- ▶ Limitations

B. Compare the different criteria

- ▶ Main: Dimensions and Power
- ▶ Secondary: Sometimes not present in the codes

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Comparison between procedures

Two recurring permits at the city level

- Planning permit



- Construction,
- Demolition,
- Transformation,
- City development, ...

- Environmental permit



- Activities or equipment having impact on environment (nature and people)

Comparison between procedures

Requirements for each geographical area

Codes	U.K.	U.S.A.	Flanders
Planning Perm	Depends	Required	Required
Building Regulations	Comply with	Comply with	Comply with
Environmental Perm	Not Required	Not Required	Depends
EIA	Depends	-	-
Ecological Concerns	Yes	Limited	Limited

Procedures' facilitation

- ▶ U.K. → Planning Permit
- ▶ Flanders → Environmental Permit

Comparison between procedures

“Permitted Development Rights” (PDR)



- 10 – 15 criteria
- Material, colour, specific areas, certificates
- Size of the system
 - ▶ Not protrude 3 m above the top line of the roof OR
 - ▶ Not exceed 15 m, whichever is the lesser
 - ▶ Swept area lower than 3.8 m²

Comparison between procedures

Limitations in the codes (if no PDR)

- U.S.A. always provide a limit AND review
- U.K. let the applicant propose, THEN review.

CONCLUSION

1. Planning and environmental permits exist everywhere
2. Permitted Development Rights facilitate the procedure
3. Limitations drive the development

Methodology

A. Compare the different procedures

- ▶ Permits required
- ▶ Permitted development right
- ▶ Limitations

B. Compare the different criteria

- ▶ Main: Dimensions and Power
- ▶ Secondary: Not present in all the codes

Comparison of criteria

Main Criteria (3)

- Height
- Setback distances
- Swept area (or power)

Secondary Criteria (17)

- Nuisance: Noise, Vibrations, Shadow flicker, ...
- System: Structure, Colour, Material, ...
- Long term: Maintenance, Replacement, Wind access protection, ...
- Security: Illumination, Advertisements, Test Facility, ...

Comparison of criteria

Main Criteria (3)

- Height
- Setback distances
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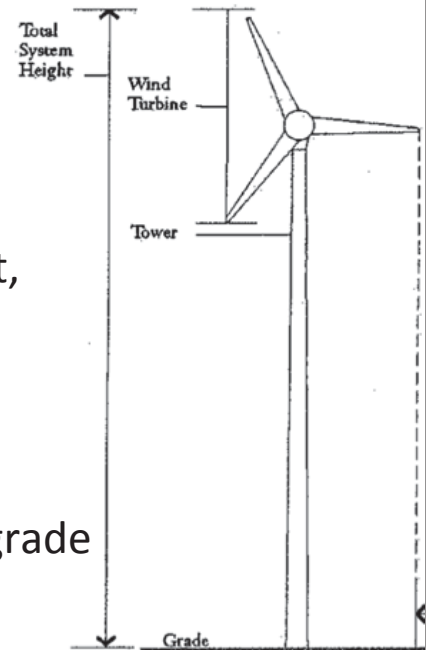
- Nuisance: Noise, Vibrations, Shadow flicker, ...
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Comparison of criteria

1. HEIGHT

Height limitations are specified as:

	<u>Examples:</u>
Height of the building	10 feet below 60 feet, percentage above
Permitted building height	20% above
Existing buildings' height	15 feet above
Defined limit	25 to 45 feet above grade



Antennas in Brussels ?

Comparison of criteria

2. SETBACK DISTANCES

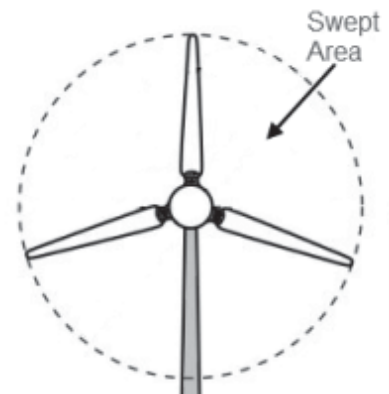
	<u>Examples</u>
Property lines	0.75 to 2 times H
Public right of ways	1 to 1.1 times H
Telecommunication towers	1.1 times H
Public utility lines	1 times H
Roof edges	10 feet
Grade clearance	15 to 25 feet
Other wind turbines	1 to 3 times H



Comparison of criteria

3. POWER – SWEPT AREA

- U.S.A. (Examples)
 - ▶ Diameter: max 20 feet (6 m)
 - ▶ Power limits



Town Code	District	Rated power capacity
Anchorage, AK	Residential zoning	No more than 10 kW
	Non-residential zoning	No more than 25 kW
North Royalton, OH	No restrictions	No more than 10 kW
Fillmore, MN	No restrictions	No more than 1 kW

Comparison of criteria

Main Criteria (3)

- Present in almost all codes
 - ▶ Height, Setback distances and Swept area (or power)

Secondary Criteria (17)

- Limited recurrence
 - ▶ Nuisance: Noise, Vibrations, Shadow flicker, ...
 - ▶ System: Structure, Colour, Material, ...
 - ▶ Long-term: Maintenance, Replacement, Wind access protection, ...
 - ▶ Security: Illumination, Advertisements, Test Facility, ...

Comparison of criteria

1. SHADOW FLICKER EFFECT

- U.S.A.
 - Minimise the shadowing beyond the property lines
- Wallonia
 - 30 hours per year and 30 min per day



Comparison of criteria

2. FEASIBILITY STUDY

- Only one code proposes this regulation
- Time and money saving



Comparison of criteria

CONCLUSION AND SUGGESTIONS

- Brussels - No dedicated framework
- Wintegrate - Pilot projects in progress
- Survey of existing codes
 - ▶ Development is stimulated and bonded

➔ Collaboration with the region and municipalities