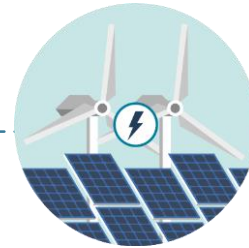


Nationaal Programma
RES Regionale
Energie
Strategie



Onderwerp: Potential Research Questions

Daan Smit

Agenda

- Who am I
- What is the RES
- Regional context
- Potential research challenges

Who am I

Education

- 1996-2001 Hanze University of Applied Sciences, Management, Economics and Law
- 2001-2003 University of Groningen, Business Administration

Work experience

- 2003-2009 Hanze University of Applied Sciences (contract management)
- 2009-heden Royal HaskoningDHV (engineering and consultancy company)
- Since April 2019 process facilitator of the ' Regionale Energiestrategie Groningen' (Regional Energy Strategy Groningen)

What is the RES



What is the RES

Meer dan 100 partijen verlagen de CO₂- uitstoot van Nederland met **49%** ten opzichte van 1990 via het

Klimaatakkoord



What is the RES

Dutch Climate Agreement

In terms of electricity, for 2030 the goals is to ensure:

- 48 Twh wind energy off shore
- 35 Twh renewable energy on land (wind and solar)
- 7 Twh solar on small roofs (50 PV)

What is the RES

- 30 RES regions
-

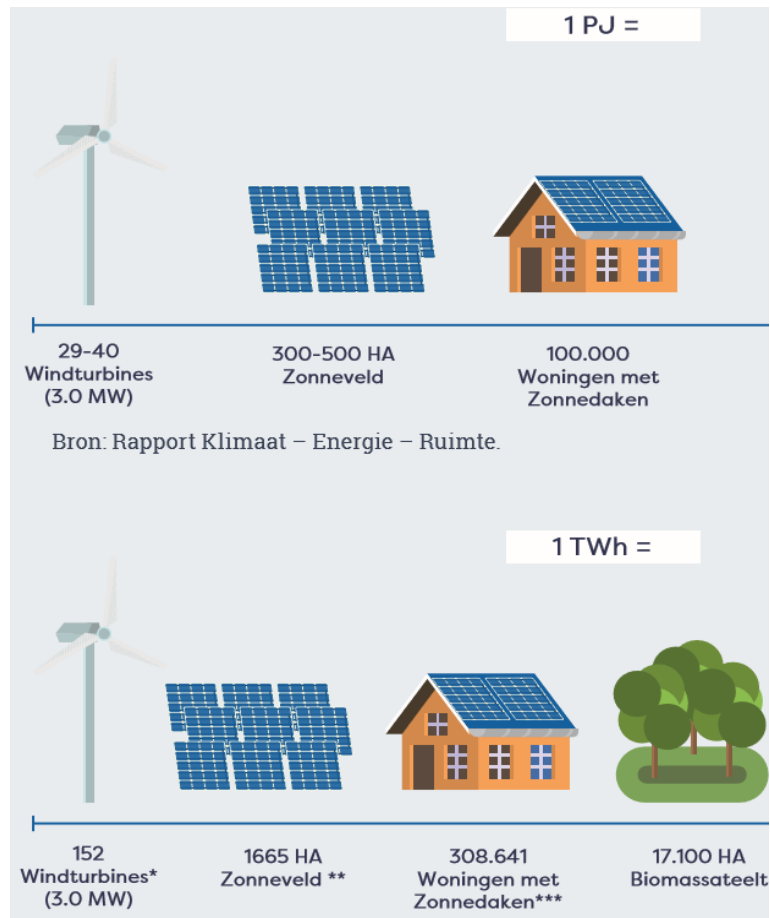
Goals (total for the Netherlands):

- 35 Twh renewable energy production on land in 2030 (collective goal, no distribution per region!)
 - 1,5 million buildings free of natural gas before 2030
 - 7 million buildings free of natural gas before 2050
-



What is the RES

1 hectare	10.000m ²
1 km ²	1.000.000m ²
1 km ²	100 hectare
<hr/>	
1 Wh	3.600 J
1 kWh	3.600.000 J
1 kWh	0,0000036 TJ
1 MWh	0,0036 TJ
1 GWh	3,6 TJ
1 TWh	3,6 PJ
1 TJ	0,2777778 GWh
1 PJ	277,777778 GWh
<hr/>	
1 ton	1.000 kg
<hr/>	
1 m ³ aardgas	31,65 MJ



- To produce 35 TWh electricity in the Netherlands means 5320 windmills of 3 MW on land
- Or 55.000 hectare of Solarfields with 0,8 MW pro hectare.

What is the RES

Regional Energy Strategy Groningen

Collaboration between:

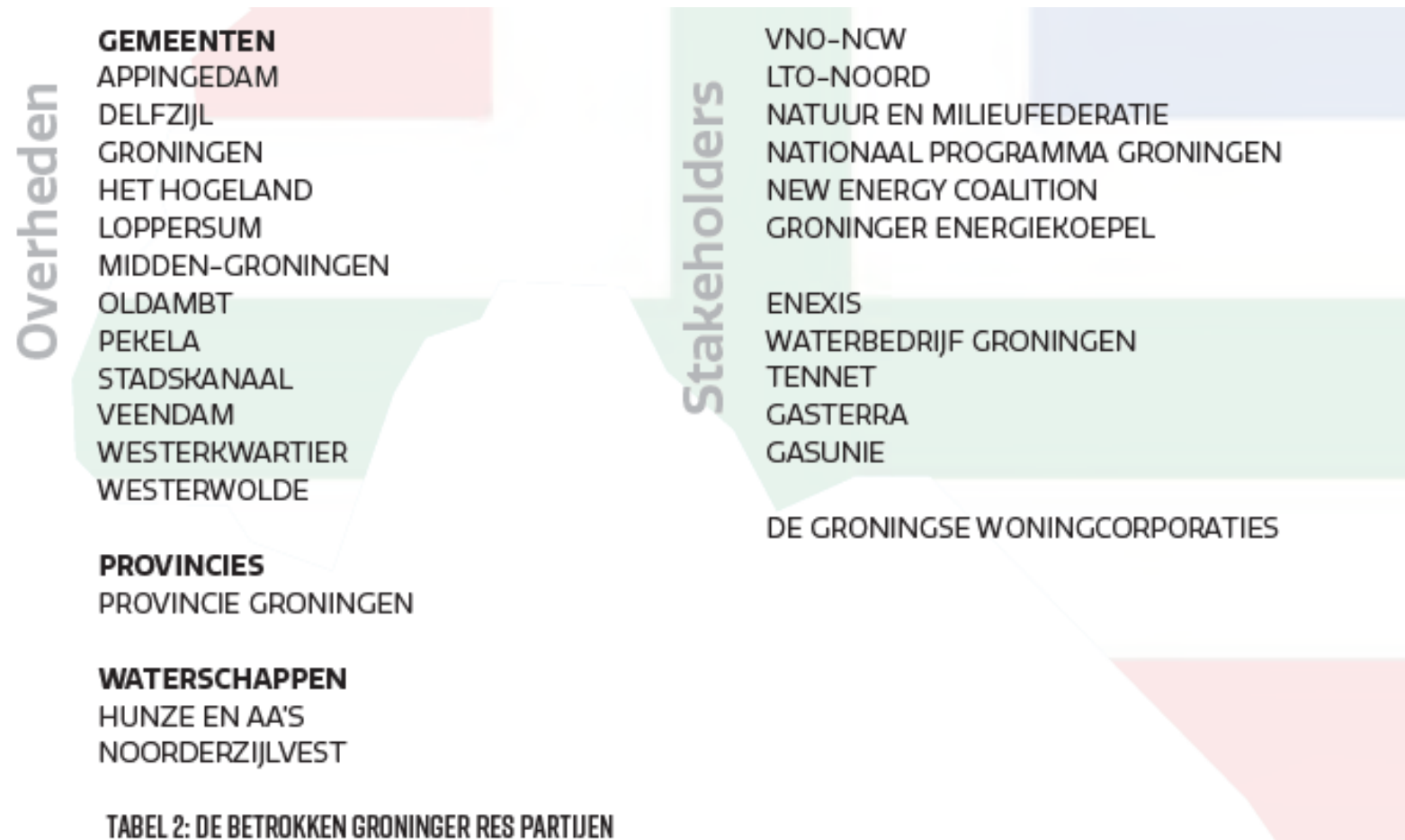
12 municipalities in Groningen

2 Waterboards

The province of Groningen

10 stakeholders

What will be the Groningen bid?



What is the RES

Starting points agreed in the Startdocument RES Groningen

- Regional perspective, we help each other to develop a regional strategy with maximum social acceptance
- A realistic offer with projects that respect the landscape and the people
- Looking for opportunities for employment
- Local ownership, social acceptance and fair distribution of benefits and burdens

Regional context

- Relatively low income and high percentage of home owners
- Relatively old building stock
- Low population density (rural area)
- Earthquakes due to gas mining (no possibility for geothermal energy production)

- (local) resistance against wind parks (and solar fields)
- Many large scale projects (the 5 biggest solar fields are located in Groningen, runner-up region in on-shore wind energy)
- Groningen is a traditional energy region

Potential research challenges

- Balancing demand and production
- Expected growth of electricity demand
- Defining social acceptance
- How can the region and its inhabitants benefit from being an energy region?
- What are the consequences of going to a decentralized energy production system?
- Which costs for heating the built environment should be socialized and which costs should be carried by individuals (house owners)?
- What are the roles of the government, citizens and market parties in implementing the regional energy strategies?