Innovation Agendas and Transitions in the Dutch Greenhouse Industry, with a case on Sustainable Energy in the Venlo region

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Wageningen UR Greenhouse Horticulture
The Netherlands

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Wageningen UR Greenhouse Horticulture

- Applied Reseach
- With Greenhouse Industry
- Sustainable Horticulture
- 120 colleages
- Turnover 14 M€ / year
- Research facilities and greenhouses (Bleiswijk)
- Projects on commercial farms (International)

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NL Greenhouse Industry is Evolving
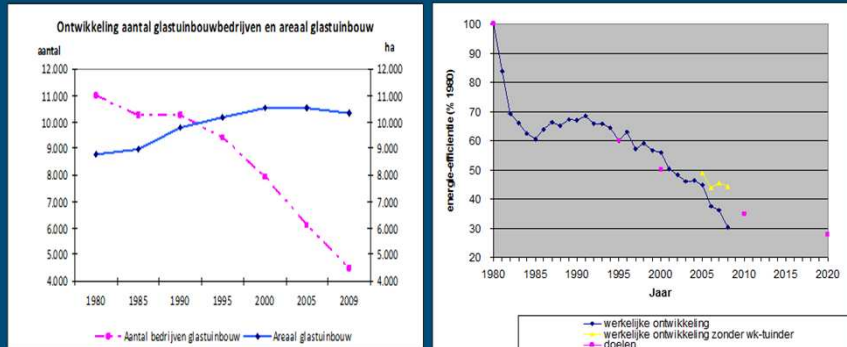
Number of companies decreases, but area is ~ stable

Efficiency increases (€ / m3 gas)   Source: LEI-WUR

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Trends in Applied Horticultural Research

- **Development of sustainable production systems**
  - Energy, water & nutrients, pesticides
- **Development of intelligent production systems**
  - ICT, machines / robots with green intelligence
- **Added value creation**
  - Marketing of healthy and convenient products
- **Integration into the (urban) landscape**
  - Development of new combinations

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Trends, Transitions and Local Agendas

- Reseach Trends represent current developments
- Transitions for a Sustainable Horticulture
- Organized in PPP
- On National and Local scale
- Focus on Energy
- Focus on regional development
- Regio Venlo, South East of NL

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Energy transition is at full speed

- **Ambitions of NL Greenhouse Production:**
  - 45 % less CO2-emission in 2020, compared with 1990
  - A yearly increase of energy efficiency of 2 %
  - 20 % use sustainable energy in 2020
  - New farms are climate neutral
  - New farms are a source of warmth and electricity
- Research programme Greenhouse as a source of energy, with several pathways
- A concrete plan of 7 steps for growers

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Kas als Energiebron

Ministerie van Landbouw, Natuur en Voedselkwaliteit

Productschap Tuinbouw

Contrasting Innovation Agendas in NL (PPP)

National (NL) priorities:

- Reduce the energy use

- Reduce the emission

- Value added chains

- Intelligent systems

- Entrepreneurship

Schoon en Zuinig
Duurzaam water en de kas
Winnen aan Waarde

Regional (Venlo) priorities:

- Create regional brands

- Use regional logistics

- Reduce the costs of energy

- Fit into the landscape

- ICT & Biobased

Provinciaal akkoord
Versnellingsagenda 2011
Kennis Kunde Kassa
Vizier op vernieuwing

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Case: Greenport Greenhouse Venlo

- Pionieering grower with 8 ha tomatoes
- A new semi-closed greenhouse
- CHP
- Use all the available solar radiation
- Maintain higher CO2 levels
- Misting for cooling, keep the windows closed
- Storage of low-grade heat (20 ° C) in aquifer
- High-grade heat for a care institution and school
- Farm produces electricity, heat, and tomatoes

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Greenportkas Venlo

Sunny Tom

Several aspects of Greenport Greenhouse

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Greenportkas Venlo

Sunny Tom

Supporting network of early adopters and pioneers

Added Value Creation ??

CHP + Aquifer + Misting + Closed Windows + Energy Grid
+ A new tasty tomato variety = Added Value Creation ??
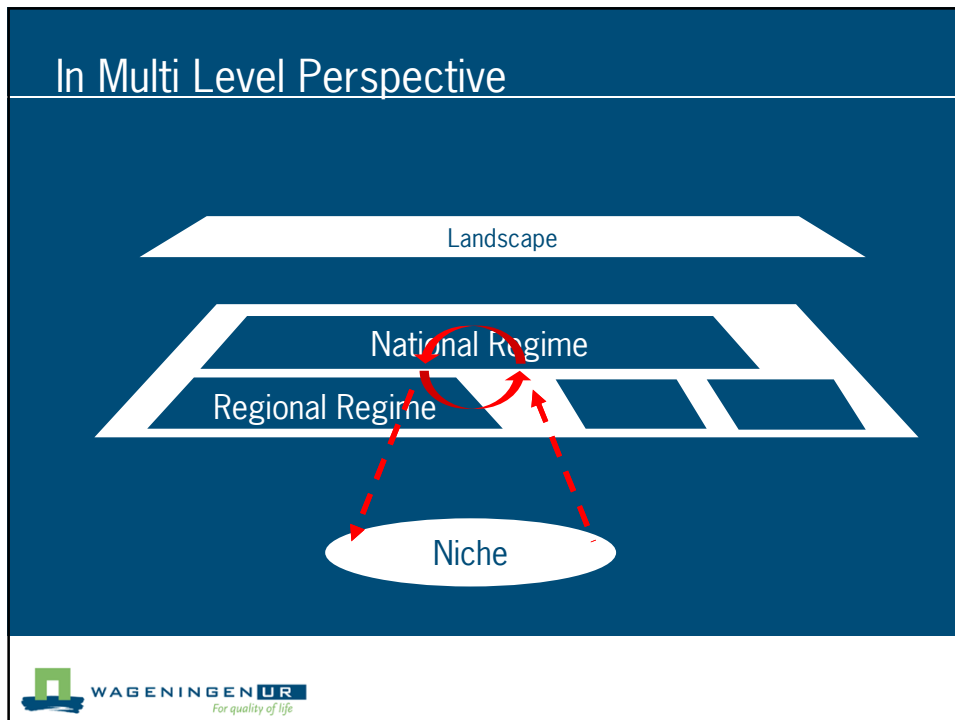
Output and Outcome

- 20 % raise in production
- Excellent tasting tomatoes
- Farm produces electricity, heat and tomatoes
- Added value of tomatoes has partially evaporated
- Lower CO2 Footprint is questionable
- Pioneer is seen as innovator
- Licence to produce & operate
- Permanent learning became standard
- New plans are made

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Greenportkas
Venlo

Sunny Tom

Impact

- The innovation influenced the Agendas:
  - An energy grid proved to be a real option
  - The innovation influenced the research agenda:
    - Bringing fresh air into greenhouses
    - Cheaper aquifers
    - Growing strategies for the local Venlo climate
    - Local networks powerful tools: other regions followed
    - Supporting a pioneer proved to be a successful strategy
    - Better tools for policy making on CO_2 foot print

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In Multi Level Perspective

Landscape

National Regime

Regional Regime

Niche

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Lessons for Niche Management:

- Framing in the regional and the national agenda
- Support from local stakeholders
- Formation of a network of early adopters
- Early adopters both supported and learned
- Coaching and support for the pioneer
- Ensure a solid scientific back-office for the coach
- Added value partially evaporated
- Pioneer earned a license to produce & operate

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Thank you for your attention!

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