



EnTranCe: Centre of Expertise Energy

“If we want things to stay as they are, things will have to change.”

Dr. Ir. Jan-jaap Aue
Hanze University of Applied Sciences

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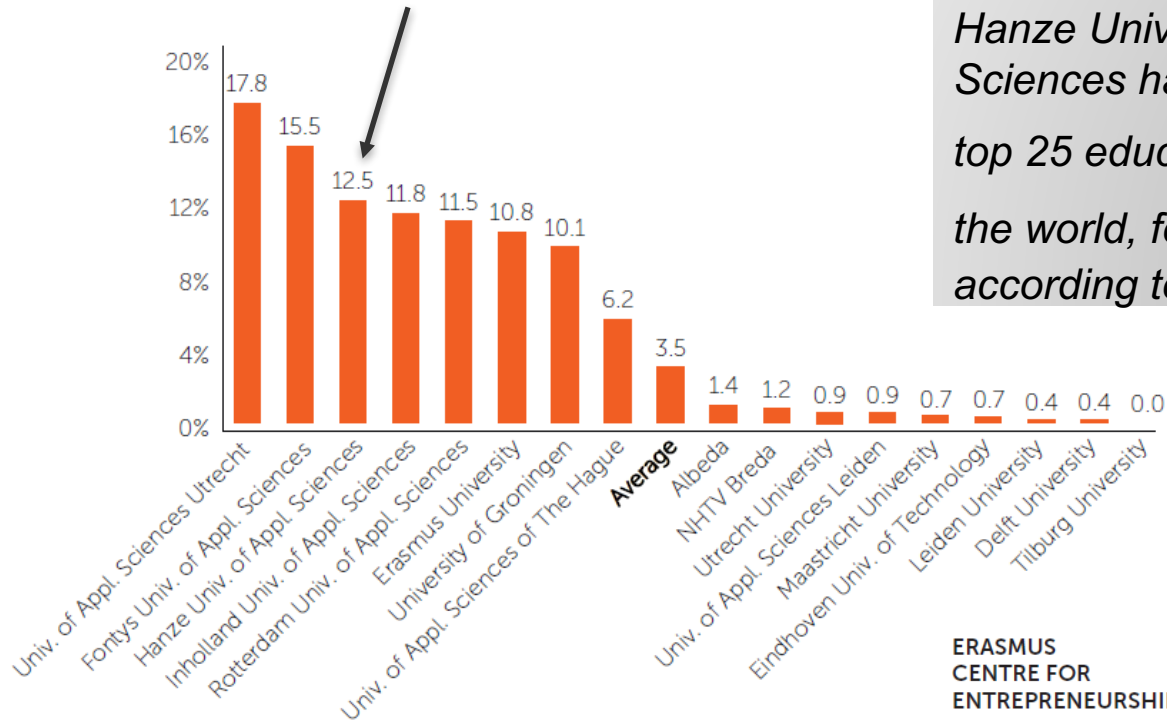
Hanze University of Applied Sciences Groningen

- Established in 1798
- Policy plan 2012-2016 rated “**Excellent**” by ministry: extra governmental funding.
- Professionally oriented higher education
- **70+** Bachelor programmes, **18** Master programmes;
- **17 Schools** with each their own atmosphere;
- 3 focal areas: **Energy**, Healthy Ageing, Entrepreneurship
- Partner in the Energy Academy Europe
- **26,500** students choose our university;
10% international, 72 nationalities

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Share of active entrepreneurs across universities



Hanze University of Applied Sciences has been ranked in the top 25 educational institutions in the world, for its applied research according to U-Multirank 2016.

ERASMUS
CENTRE FOR
ENTREPRENEURSHIP

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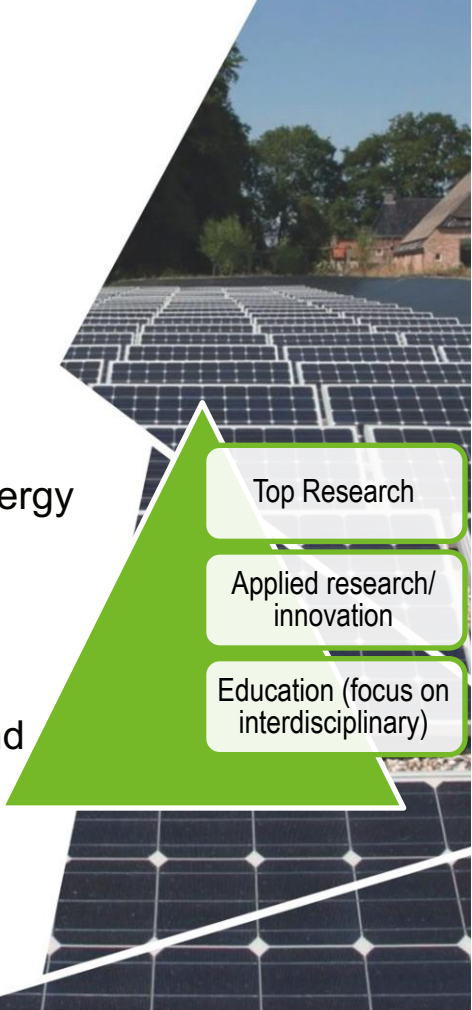
Economic view of the region



Energy Academy Europe

Cooperation of Businesspartners, Hanze University of Applied Sciences, University of Groningen)

- Urgent energy challenges (global warming, energy security, economic growth) for public and private sector.
- Open model in education / research / innovation
- **Focus on transition** to sustainable, reliable and affordable energy
- Facing these challenges requires:
 - Vital **knowledge and experience** in energy matters
 - A continuous supply of properly trained **personnel**
 - High quality **multi-disciplinary approach** in education and research
- Energy Transition: new business opportunities !
- Fieldlab of Energy Academy Europe at Hanze UAS:
EnTranCe (The Energy Transition Center)



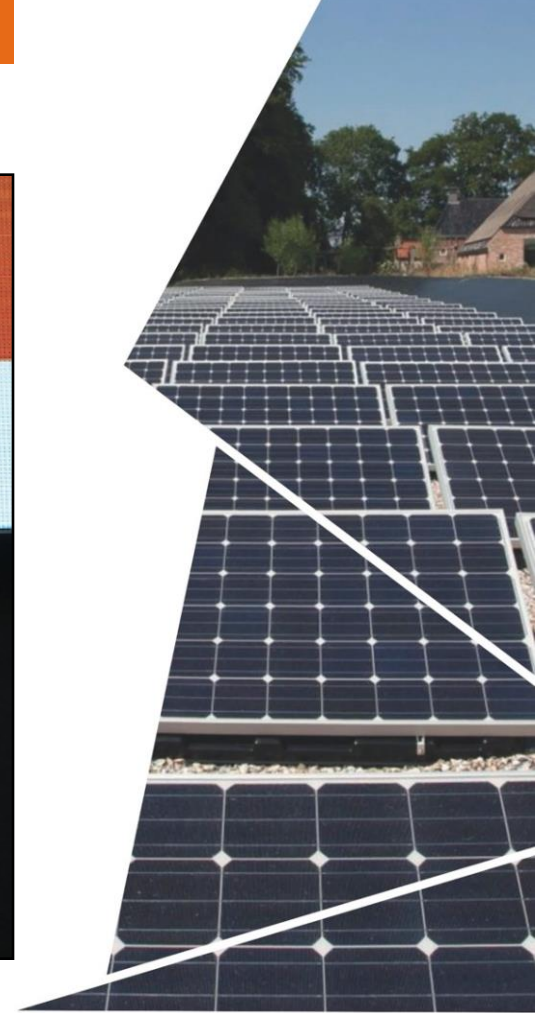
Top Research

Applied research/
innovation

Education (focus on
interdisciplinary)

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October 2015 Opening by King Willem Alexander



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2015 : Commisioner Sefcovic @EnTranCe



Goals 2022

- Together with develop conc (Neutral) com
- In 2022 we ec Students
- We realised 2
- We induced 2 region based



SEITE 26 | NORDWEST-ZEITUNG | NR.87

WIRTSCHAFT

Ökoenergie-Branche will 200 000 Jobs schaffen

STUDIE Bundesverband BEE: Investitionen sollen sich bis 2020 verdoppeln – 20 Prozent der Stellen derzeit in Niedersachsen

Die Zahl der Arbeitsplätze soll in zehn Jahren auf 500 000 steigen. Dann könnten 47 Prozent des Stromverbrauchs durch die „Erneuerbaren“ gedeckt werden.

VON NORBERT WAHN, REDAKTION BERLIN

BERLIN – Bis 2020 verdoppeln sich die jährlichen Investitionen durch den Ausbau der Erneuerbaren Energien auf über 28 Milliarden Euro. Insgesamt investiert die Branche in den nächsten zehn Jahren allein in Deutschland 235 Mrd. Euro in Anlagen zur Erzeugung von Strom, Wärme und Kraftstoffen aus Erneuerbaren Energien. Dann sollen rund 47 Prozent des Strom-, 25 Prozent des Wärme- und 19 Prozent des Energieverbrauchs im Verkehr in Deutschland durch erneuerbare Energien gedeckt werden.

Das geht aus einer aktuellen Studie der Prognos AG hervor, die der Bundesverband Erneuerbare Energie (BEE) gemeinsam mit der Agentur für Erneuerbare

Energien und der Deutschen Messe AG in Auftrag gegeben und am Mittwoch in Berlin vorgestellt hat. Grundlage für die Berechnungen von Prognos sind die Ausbauproschnen der Branche für die Erneuerbaren Energien in den Sektoren Strom, Wärme und Verkehr bis 2020.

Die Zahl der Beschäftigten soll im gleichen Zeitraum von

„Die Erneuerbaren können eine immer wichtigere Bedeutung für den Standort Deutschland haben“

JENS HOBBOHM

derzeit 300 500 auf 500 000 steigen. Rund 20 Prozent der derzeit 305 000 Arbeitsplätze der Branche entfallen nach Schätzungen des Landeswirtschaftsministeriums allein auf Niedersachsen.

„Voraussetzung für diese positive Entwicklung sind allerdings stabile politische Rahmenbedingungen wie sie z.B. im Stromsektor das Er-

neuerbare-Energien-Gesetz bietet“, erklärt BEE-Geschäftsführer Björn Klusmann. Auch in den Sektoren regenerative Wärme und Verkehr müsse die verlässliche Förderung der Erneuerbaren Energieträger sowie deren umfassende Integration in die Energieversorgung nun zügig vorangebracht werden.

Sorgen bereitet Klusmann derzeit der Wärmesektor. Dem ohnehin vom Bundestag um 19,5 Millionen Euro gekürzten Ausbauprogramm drohe durch eine Haushaltsperre endgültig das Aus.

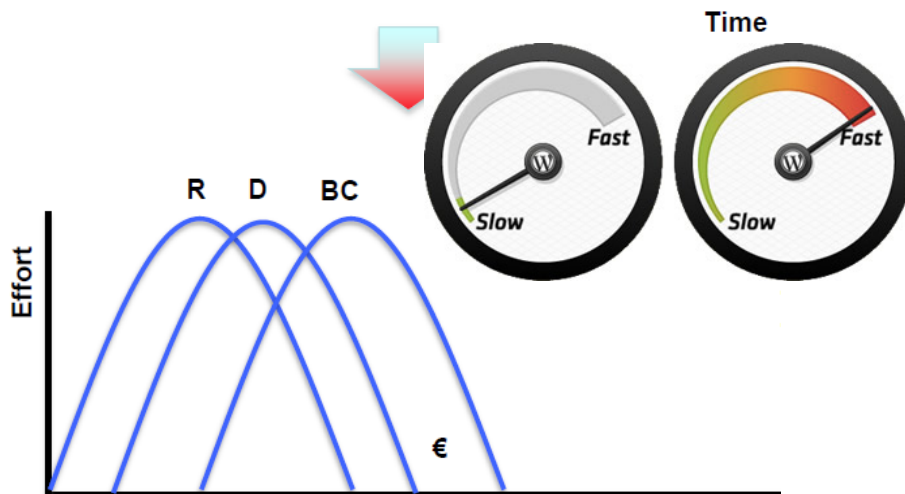
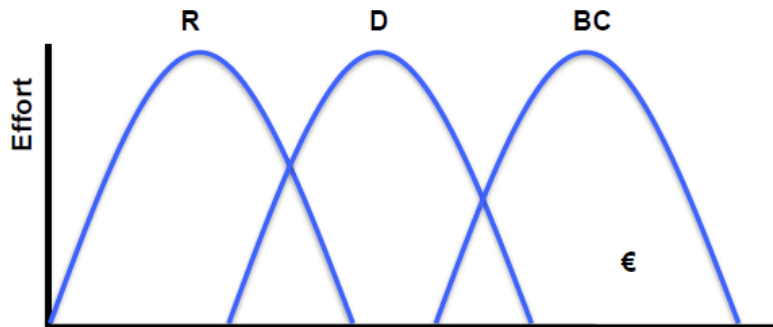
Die Investitionen durch den Ausbau der „Erneuerbaren“ liegen schon heute über denen der konventionellen Strom- und Gasversorger, die nach Angaben des Bundesverbandes der Energie- und Wasserwirtschaft 2009 rund 12,4 Mrd. Euro betragen.

Jens Hobohm, Leiter Energiewirtschaft bei Prognos: „Die Ergebnisse unserer Berechnungen zeigen, dass Erneuerbare Energien in den nächsten Jahren eine immer wichtigere Bedeutung für Deutschland haben können, wenn die Ausbauproschnen der Branche eintreten.“



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Speeding up innovations



- Inter-disciplinary
- Multi-Level
- Co-ownership
- Young People
- 'Just do it'
- Show options and their impact
- Stakeholders Dialogue

Time
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Position: Bridging Two Worlds



Hanze UAS



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How?

Educational programmes

- Energy Routes in 10 schools leading to EAE certification
- Learning Community
- Master (MSc) portfolio
 - European Master Renewable Energy
 - Master Sustainable Energy System management
 - Master Energy 4 society (under dev)

Facilities

- Energy Value Chain
- Energy Barn
- EnTranCe

EnTranCe
ENERGY TRANSITION CENTRE

Partners

- Business partners
- Governmental partners
- Societal partners
- stakeholders

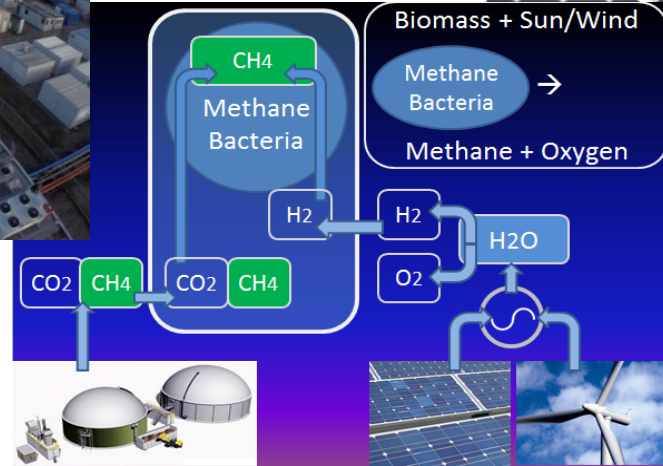
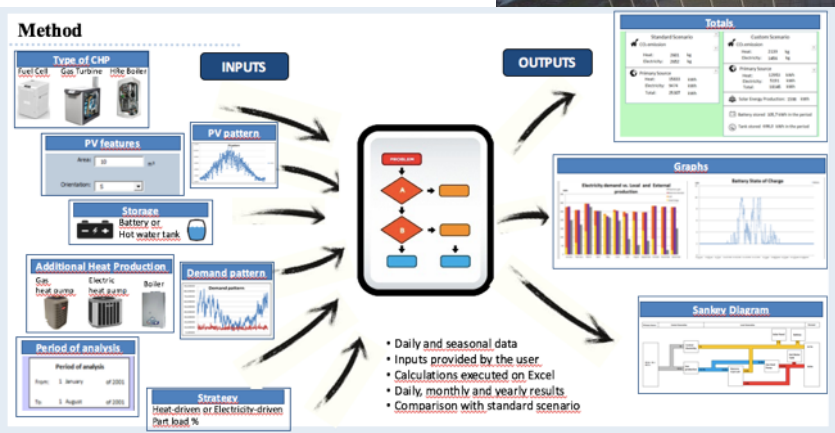
Applied Research

- Hybrid energy system design & Management
- Alternative gasses and hybrid-fuels
- Energy interventions and behaviour, public support and communication
- New economic realities, labour market, governance and legal aspects in the energy sector
- Sustainable communities and local initiatives

ove the world.

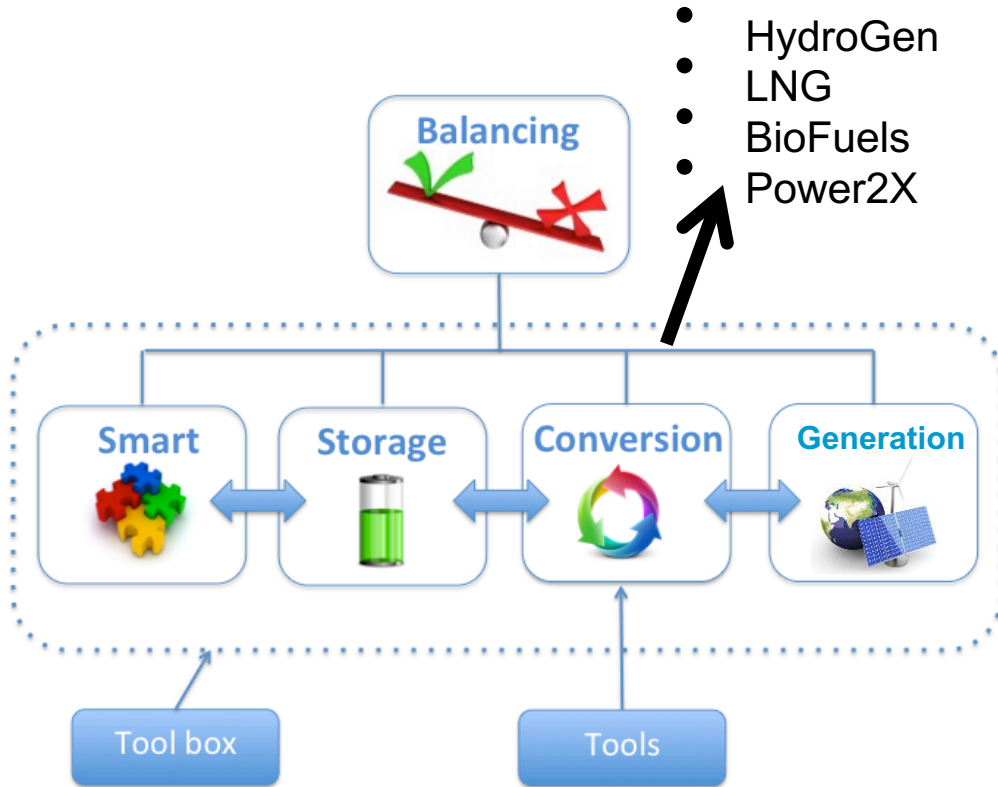


Example: Hybrid Energy System Design



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Toolkit & Power2X



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Example: Clean Energy Design Model

CLEAN ENERGY DESIGN MODEL

SCENARIO PLANNER | NPV Costs | Expert settings | Graphs | Expert dashboard | Expert results

Renewable energy planner

Energy production village

Energy production house

Solar PV economics

Energy saver house

House insulation model

Global warming prediction model

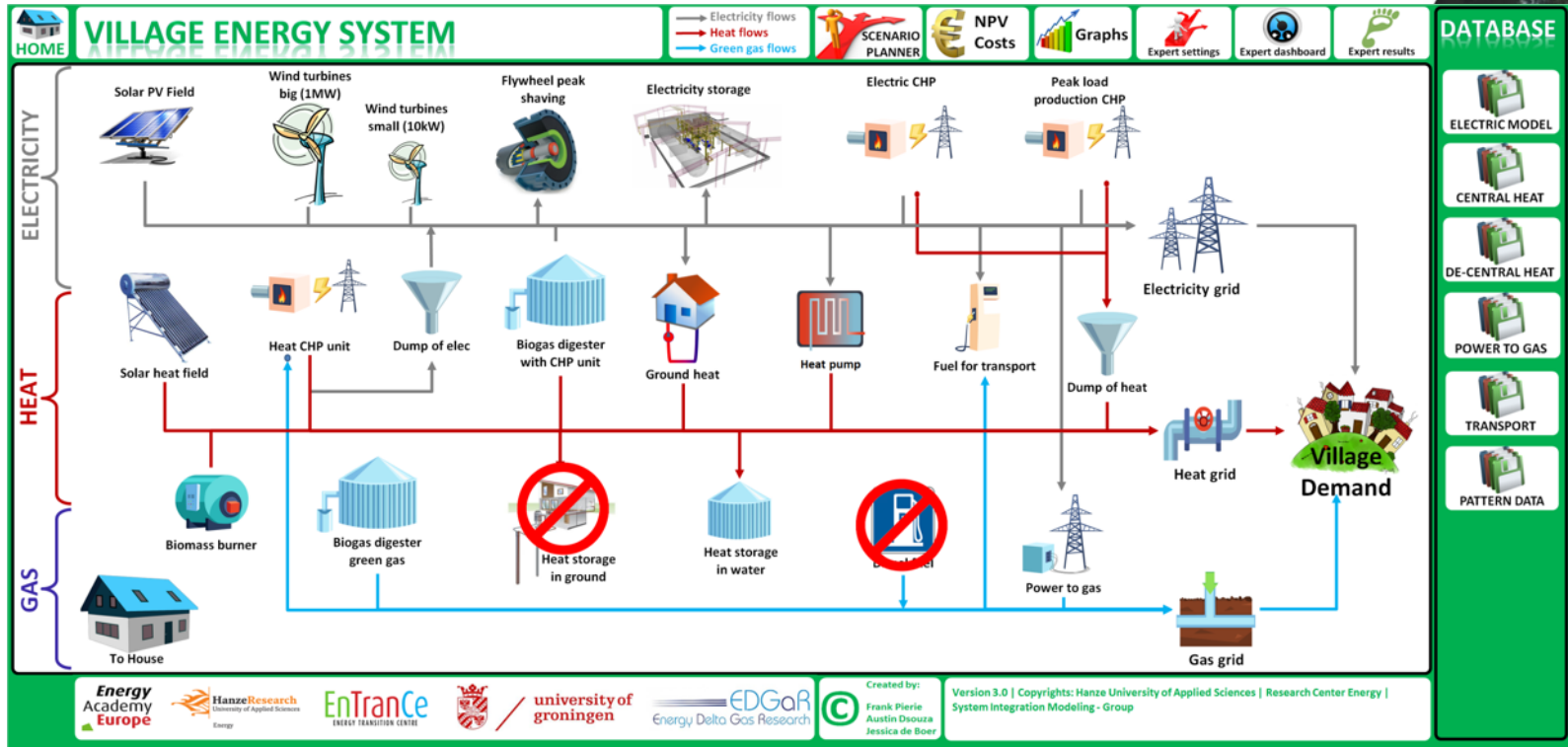
NPV

Energy Academy Europe | Hanze Research | EnTrance | university of groningen | EDGAR | Created by: Frank Pielke, Kees-Jan Dierckx, Jessica de Roo | Version 3.0 | Copyrights: Hanze University of Applied Sciences | Research Center Energy | System Integration Modelling - Group



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Example: Clean Energy Design Model



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Example: Clean Energy Design Model

HOME
SCENARIO PLANNER
RUN SIMULATION
ENERGY SAVER
NPV Costs
Graphs
Expert settings
Expert dashboard
Expert results

MAIN INPUTS AND OUTPUTS

1) MAIN PARAMETERS		Electricity	Heat
Household	1500		
Heat grid	0	0	0
Energy use per household	3500	17500	0
2) SOLAR PV			
Decentral	0	0	0
Central	10.0	10.0	0
3) WIND TURBINES			
Small turbines (10 kW)	0	0	0
Big turbines (2 MW)	1.0	0	0
8) BIO-COMBUSTION			
Heater with wood burner	0	0	0
Hectares of forest waste	0	0	0
Hectares of production forest	0	0	0
Hectares of wood	0	0	0
4) CHP UNITS			
Decentral	0	0	0
Central	0	0	0
5) HEAT PUMPS			
Decentral	0	0	0
Central	0	0	0
6) CO-DISTILLATION			
Decentral	0	0	0
Central	0	0	0
7) ENERGY STORAGE BATTERIES			
Central storage capacity	0	0	0
In-house storage capacity	0	0	0
9) PEAK SHAVING ELECTRIC WITH STORAGE			
Storage capacity	0	0	0
Discharge / Charge limit	0%	50%	0
10) TRANSPORT			
Average distance travelled	20000	0	0
Gasoline	20%	0	0
Diesel	20%	0	0
Electric	20%	0	0

1) Local Renewable production (% of demand)

1.1) Space use (ha)

2) Payback period calculation

3) Electric Production/Demand Load Duration Curve

SHARE (%)

ELECTRICITY

HEAT

TRANSPORT

ENVIRONMENTAL INDICATORS

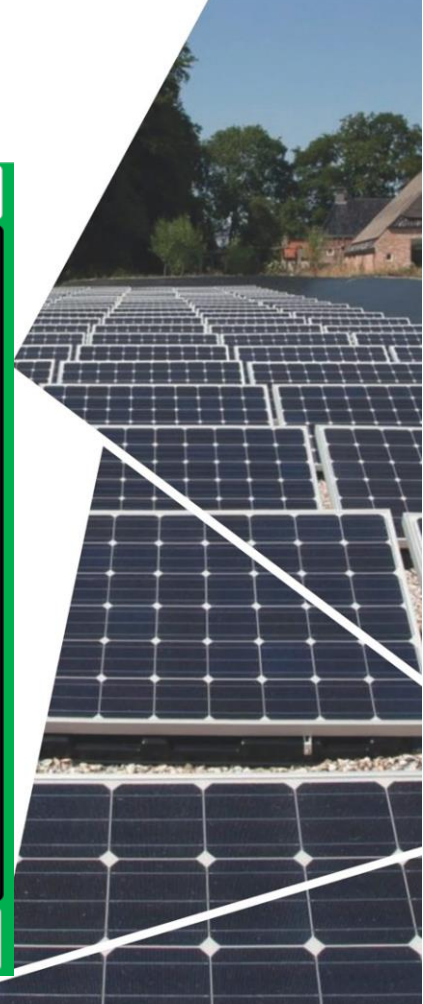
Efficiency (kWh/kWh)	Emissions (gCO2eq/kWh)	Impact (mPt/kWh)
2.00	0.60	0.10
0.00	0.00	0.00

Efficiency (kWh/kWh)	Emissions (gCO2eq/kWh)	Impact (mPt/kWh)
0.18	0.20	0.02
0.02	0.01	0.01

Efficiency (kWh/km)	Emissions (gCO2eq/km)	Impact (mPt/km)
1.2	0.3	0.020
0.4	0.1	0.005

Created by:
Frank Pierie
Austin Dosouza
Jessica de Boer

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What's on offer?

- Collective Intelligence: brains of co-creation
- Office- and workspace
- Active network of energy related companies
- Access to knowledge and experience on energy
- A Stage to the world (8000+ visitors expected this year)
- Students !
- Access to Workshops (mechanical, electronics, chemical)
- Experimental test facilities : energy value chain
- Access to launching customers



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Change Agency Ameland in Transition

[short video on EnTranCe and the island of Ameland](#)

[Long video on Entrance and the island of Ameland](#)



Name: Jan-jaap Aué

Position: Dean Centre of Expertise Energy

E-mailaddress: j.aue@pl.hanze.nl