



Smart Grids in the Netherland

Frits Verheij
Chairman of the Board
TKI Switch2SmartGrids

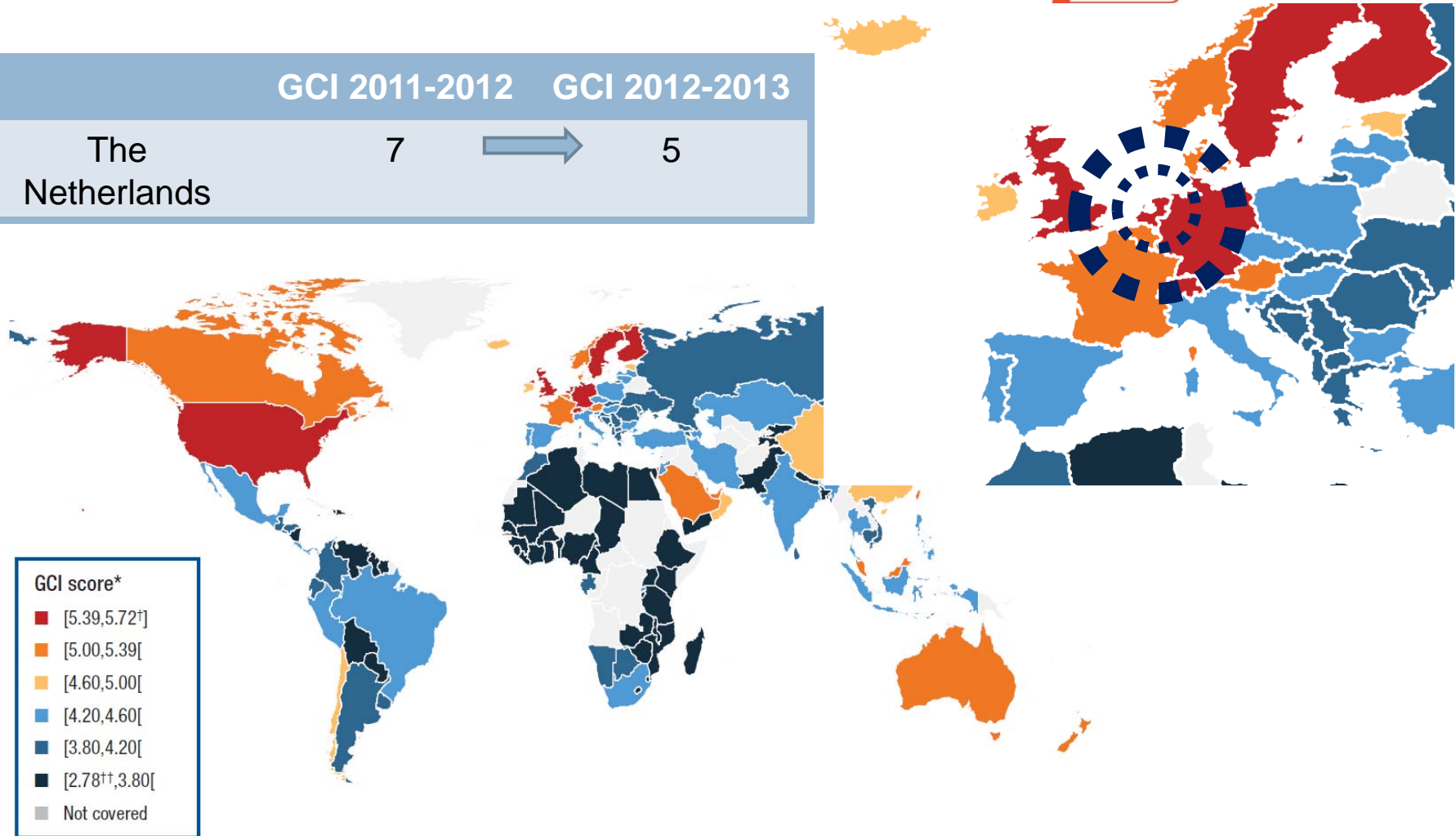
June 5, 2013

Economic Mission Netherlands to
Germany

The World Economic Forum Global Competitiveness Index Heat Map

2

tkswitch2 smartgrids



The Dutch innovation policy ambitions

3

tki switch 2 smartgrids

- Strengthen position in the top 5 of global knowledge economies by 2020 (GCI/WEF)
- Increase Dutch R&D efforts to 2.5% of GDP by 2020
- Establish Top consortia for Knowledge & Innovation (TKIs) by 2015
 - At least **40%** of consortia financed by private sector



Picture: Leslie Juvin,
liveloveleslie.com

From top sector policy to smart grid innovation

4



- Top sector policy of the Dutch government
 - ▣ Concentration of R&D funding in nine sectors, including energy
 - ▣ Demand and supply of knowledge in these sectors should be better connected, i.e. stronger role for private sector
 - ▣ Improving cooperation between companies, universities and government
- Top Team Energy determined seven themes, including Smart Grids
- Innovation Contract Smart Grids 2012 has been formulated, total budget is €25,9 million with a 56% share from companies
- 17 projects have been awarded in 2012
- Innovation Contract has been defined for period 2013-2015, budget from government for 2013 is €5,7 million

Agenda of TKI S2SG – organizing SG community

5

tki switch 2 smartgrids

- Being a top consortium of SG throughout the ‘innovation chain’, i.e. RD&D, and implementation
- Actively stimulate cooperation between companies, academia and governments (match making), and create critical mass in selected topics
- Create ‘eco system’ at both local and international level



Being connected, the new world of energy

6

tki switch 2 smartgrids



Super computers that fit in the palm of your hand



Data tsunami



Real-time streaming information



Access to 'the cloud'



Open systems

Open data

New technologies, new business models, new careers



Mobile, and socially connected anytime



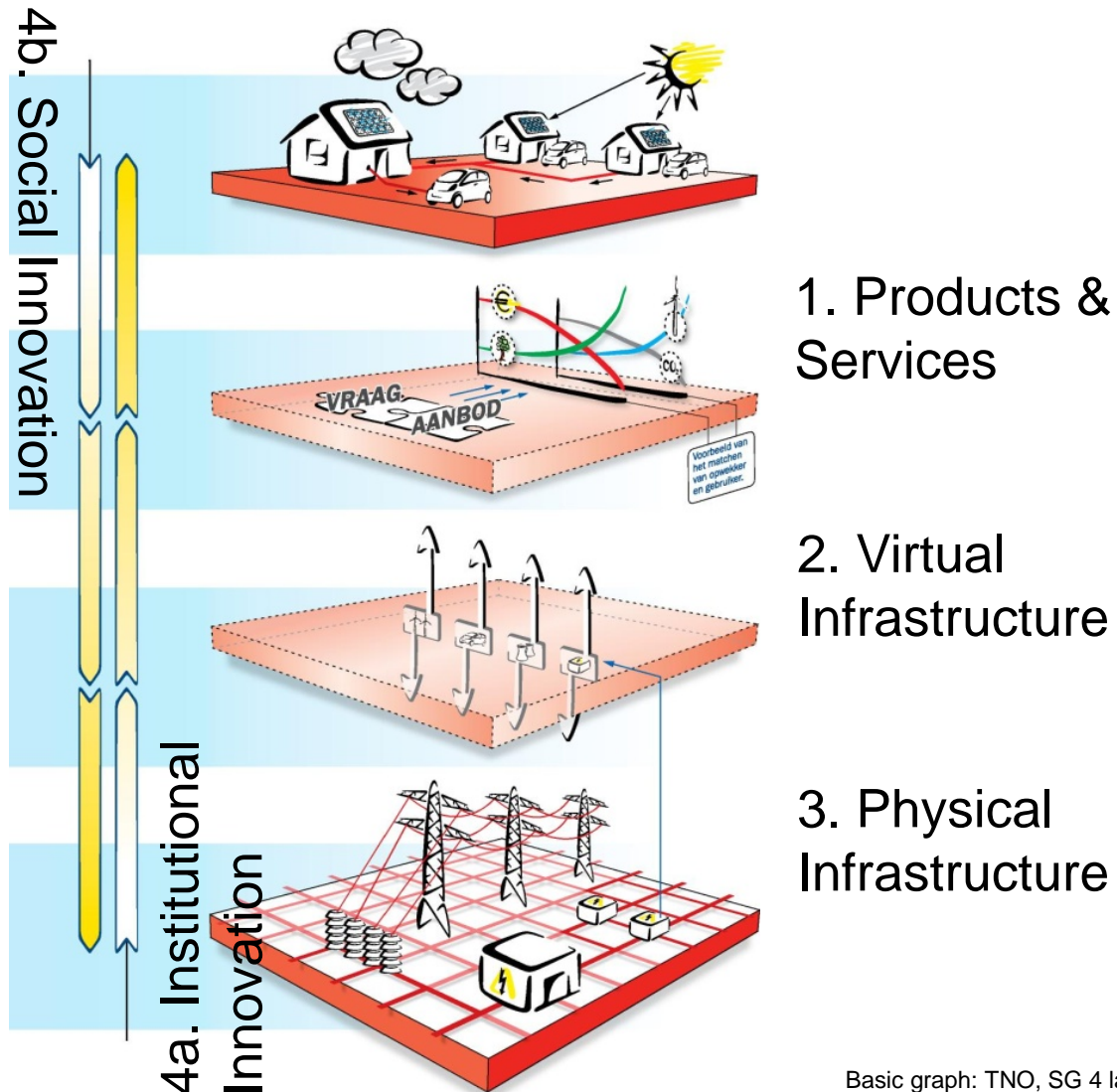
Social media, social trends

Innovation in SG is about cooperation, multi disciplinary, openness

Innovation Contract Smart Grids: 4 closely linked program lines

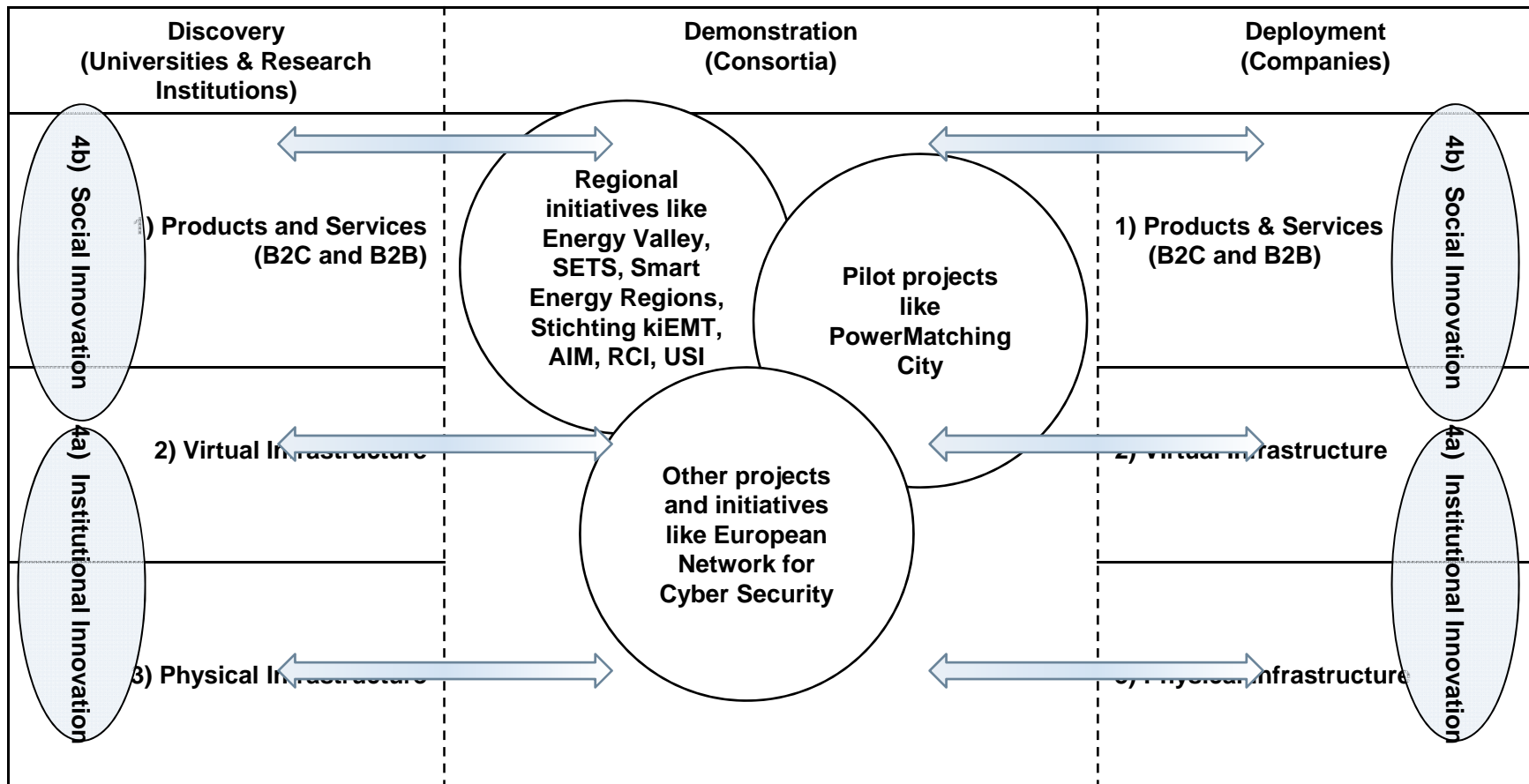
7

tki switch 2 smartgrids



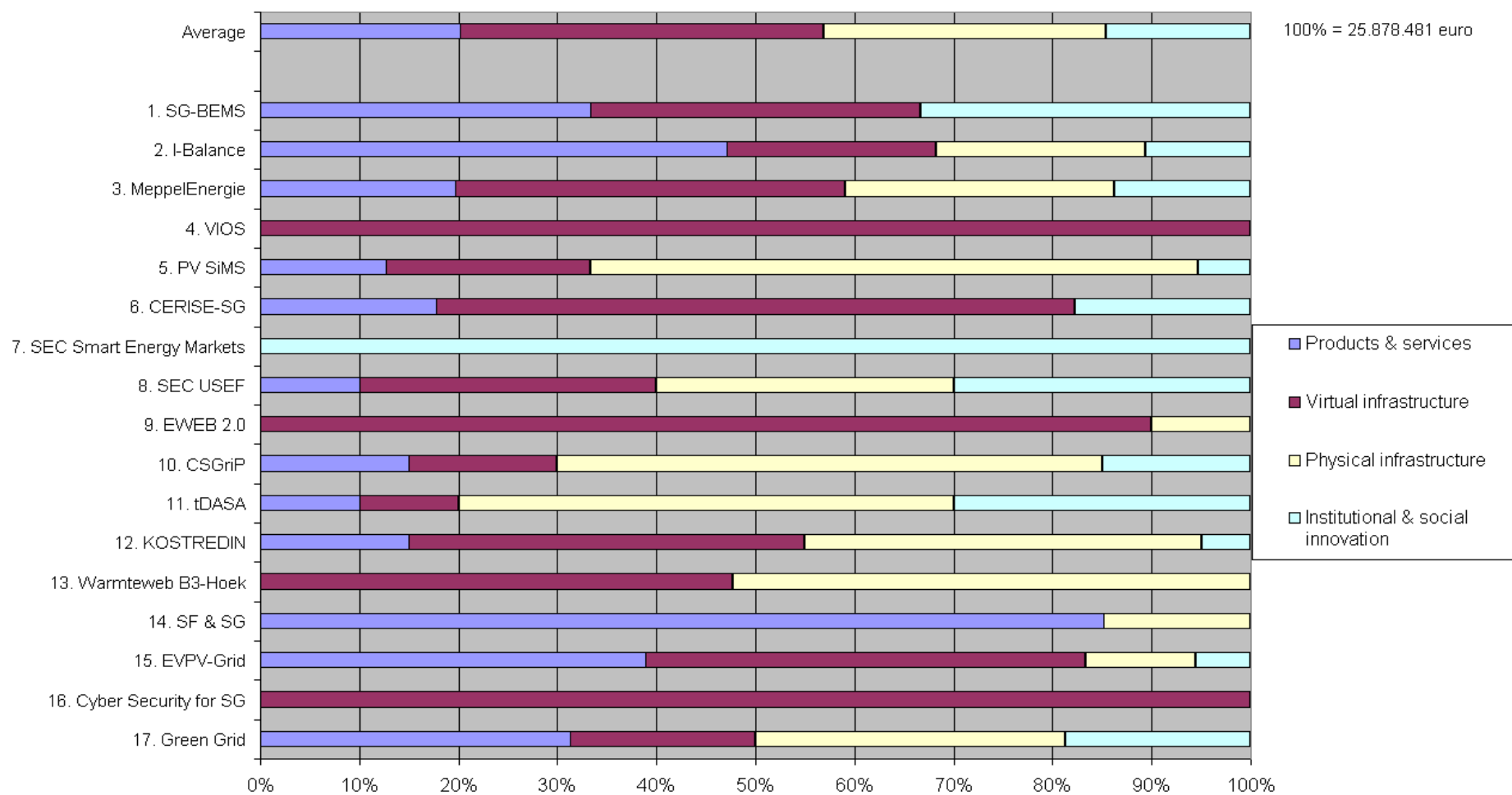
Basic graph: TNO, SG 4 layer model

Four interlinked program lines, all covering research up to market application



Projects started in 2012

Division of budgets for the 2012 projects among the four program lines



- Products & services
- Virtual infrastructure
- Physical infrastructure
- Institutional & social innovation

2013 priorities

10

1. Products and Services

- Energy management, including energy storage as a product or service to consumers, companies, and grid operators
- Goals are to facilitate distributed generation as well as to provide insight to stakeholders and support energy saving

2. Virtual infrastructure

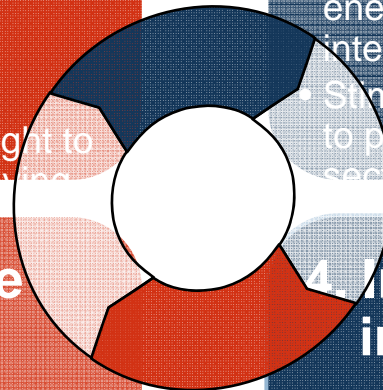
- National and international standardization of protocols and interfaces, e.g. open energy framework, ICT architectures, interoperability, security by design
- Stimulate smart grid projects to be linked to projects in the ICT Roadmap (cross-sector TKI)

3. Physical infrastructure

- Asset management of smart grid infrastructure
- Integration of RES
- DC grids and DC interfaces
- Close cooperation with Dutch branch organization of grid operators

4. Institutional and social innovation

- Optimal use of 'flexibility' of the energy system, taking the different interests of the stakeholders into account
- New and changing roles in the energy sector
- Development of services and business



Innovation contract 2013

Challenges on short and medium term

11



- **Goal of innovation contract.** New, affordable products and services to balance demand and supply. Prevent grid congestion. Support stabilising the energy supply as well as saving energy. SG is 'enabler' of other developments in the energy sector.
- **Longer term goal.** Increase and consolidate status of R&D on specific subjects. Stimulate innovations and deployment in participating companies. Bundling and strengthening cooperation between highly qualified experts.
- **2013 goal.** Develop roadmaps for all program lines to determine R&D focus for coming years, and to be timely prepared for an energy supply based on smart grids. Improve cooperation with other TKIs, e.g. EnerGO & Solar Energy.

The Dutch characteristics

12

Culture

- Conducive innovation environment
 - Mindset of creativity, collaboration and reliability
 - Strong and open consultation and consensus model
 - Striving for open standards and open source
- Strong societal involvement
 - Well developed PPPs, e.g. national innovation policy, local initiatives
 - Many citizen initiatives, privacy consciousness, various living labs

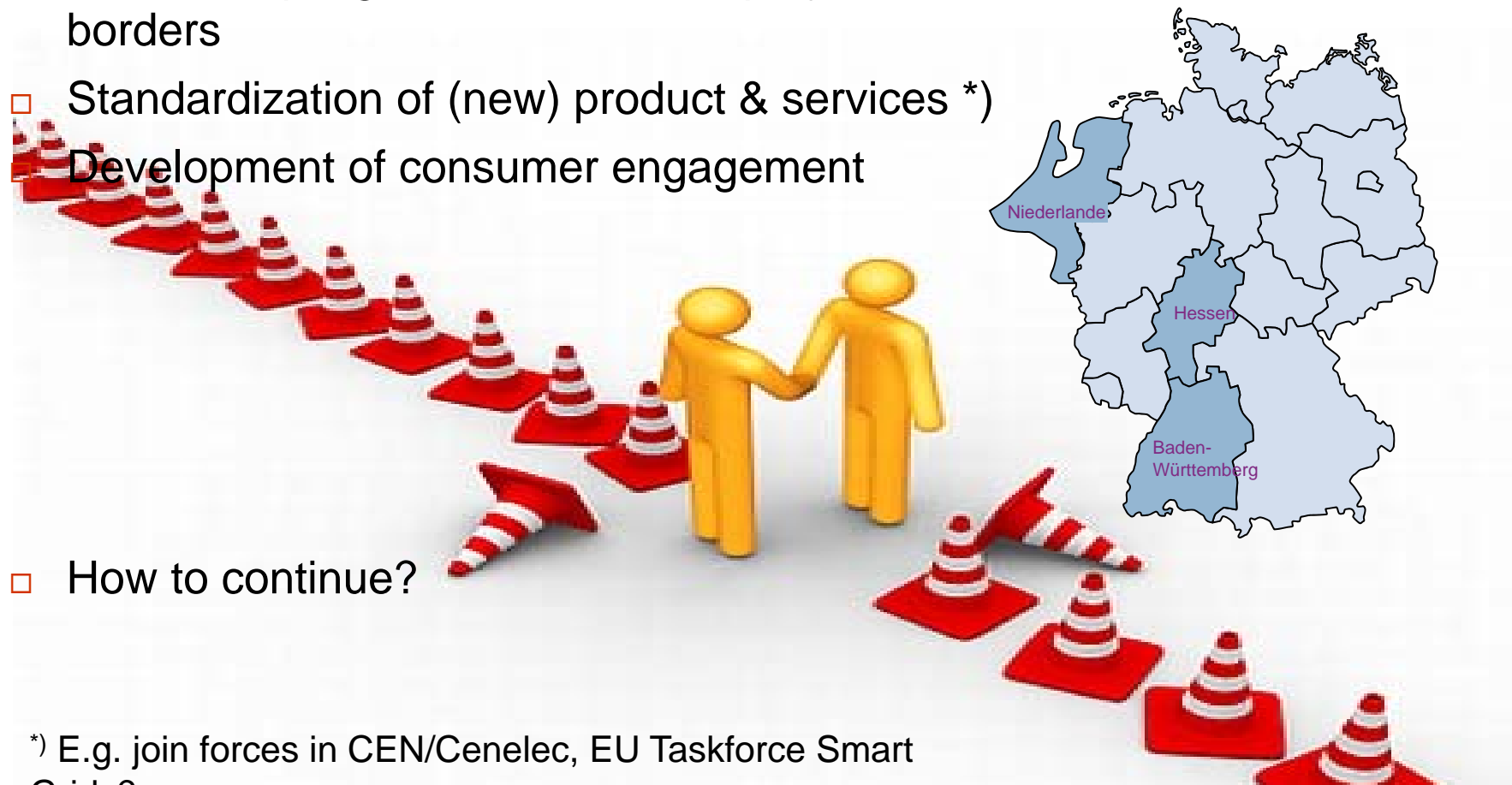
Energy market

- Unbundling of TSO, DSO, production/trade/supply
- Well developed gas industry
- Integrative approach to energy carriers
 - Multi utility, Multi stakeholder
- 12+ Smart Grid demonstration projects

Collaboration opportunities

13

- Open living labs for innovation
- Virtual coupling of demonstration projects on both sides of the borders
- Standardization of (new) product & services *)
- Development of consumer engagement



- How to continue?

*) E.g. join forces in CEN/Cenelec, EU Taskforce Smart Grids

14

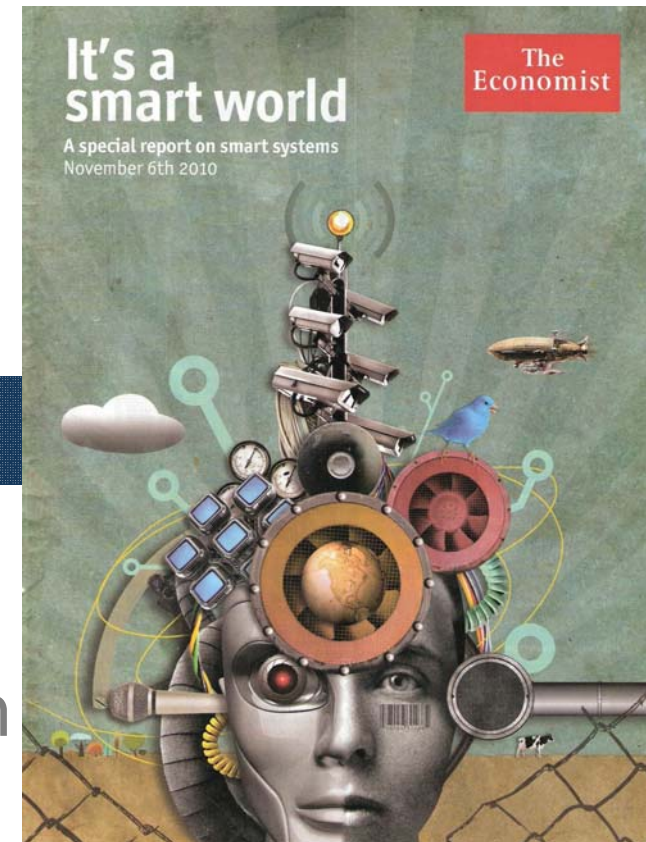
Thank you

Frits Verheij

frits.verheij@dnvkema.com

+31 26 356 2445

www.tki-switch2smartgrids.nl (as of mid-June, 2013)



Some Dutch innovation hotspots

Appendix

Amsterdam Smart City

16

tki switch 2 smartgrids

The City of Amsterdam, its inhabitants, and business are involved in the following projects



Sustainable Living

- West Orange
- Geuzenveld
- E-management in Haarlem
- “Onze Energie”



Sustainable Mobility

- Ship to Grid
- EV charging @ home and office



Sustainable Working

- ITO Tower
- Monumental Buildings
- Municipal Buildings
- Zuidas Solar Challenge



Sustainable Public Space

- Climate Street
- Smart Schools
- Sustainable Swimming pools
- Solar workplace outside



Amsterdam Smart City – Partners

17

Founding Partners



Strategic Partners



City of Amsterdam



Utilities & Infrastructure



Universities & Knowledge institutions



Techno starters



Living, Offices & Buildings



Network platforms



Consultancy



Telecom & Communications



Various



Brainport Region Eindhoven Hotspot of high tech and design

18

Brainport Region Eindhoven has been declared
Intelligent Community of the Year in 2011.

tki switch 2 smartgrids

The heart is the High Tech campus area, and is home to:

- more than 100 companies and institutes
- 8,000 researchers, developers, and entrepreneurs
- 50% of all Dutch patent applications
- open Innovation & Triple Helix collaboration
- design of innovative human-technology interactions and business models.

Besides the High tech campus there are several other campuses:

- automotive campus, including electric vehicles
- Eindhoven university of Technology Campus

The combination of high tech development and (Dutch) design is creating the industries of the



Picture: Rob van Leeuwen, www.sync.nl

Brainport Region Eindhoven

Gateway to European entrepreneurship

19

Innovation & Entrepreneurship Energy at
Brainport Eindhoven

High tech solutions and materials e.g. :

- for (thin film) solar
- interconnection techniques (e.g. sensing and ict)
- electric vehicles.

Strong **interaction** between development, start-ups, international companies and (local) governments.

Strong position is recognised by Europe as one of the six locations of the **KIC InnoEnergy**, and covers the region with Belgium en Luxembourg.

tki switch 2 smartgrids



Energy Valley



tki switch 2 smartgrids

20

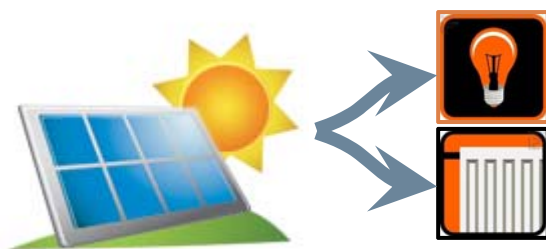
- Background: gas related industry, originating around the largest gas field in North-Western Europe
- Current situation: Hotspot for conventional, sustainable and integrated energy projects
- Focal point: multi-utility (gas, power, heat) smart energy infrastructures at local, regional and pan-European level
- Key competences: integration of gas infrastructures into smart grids, large scale offshore wind balancing
- Examples:
 - Powermatching City Hoogkerk – demand side management and trade between prosumers
 - iBalance – Local balancing in autarky, using (bio)gas and solar and wind
 - ENSEA – Pan-European balancing between sustainable and conventional energy sources

KiEMT – multi utility energy management

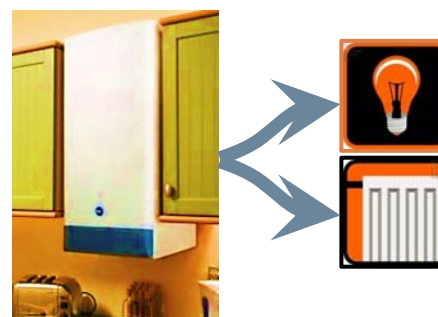
Multi utility approach to smartgrids and district optimisation



Solar PV & Thermal



Micro CHP



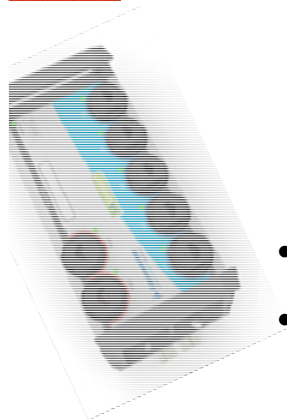
Building management



KiEMT – Manufacturing and installation engineering

22

tki switch 2 smartgrids



SA Sensor®

Locamation
smart smart grid solutions



- Minimize grid investments,
- decrease operational costs
and
- increase customer value

Main benefits achieved:

- Substantial cost savings (OPEX & CAPEX).
- More functionality, higher reliability.
- Focused development of competences including advanced analytics.
- Reduced installation time for replacement old secondary installation.
- Reduced maintenance and work on site.
- Standardization of Method of Working, protocols, signals, alarms, etc.

the PowerRouter
you're in charge

nedap

