

# Smart Charging in the Built Environment

TKI Urban Energy

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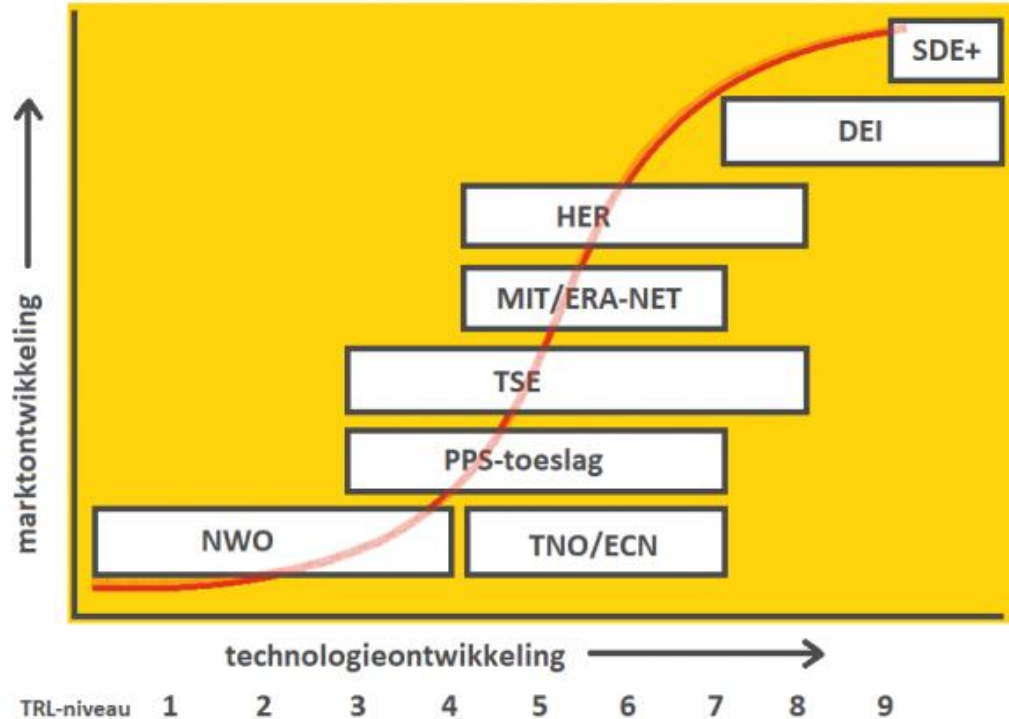
**TKI URBAN ENERGY**  
Topsector Energie



# TKI Urban Energy

- Part of the Topsector Energy
- Focus on the built environment
  
- Mission
  - Vision and program development
  - Network development and consortium formation
  - Status updates and knowledge dissemination

# Subsidies (1)



SDE+	Stimulering Duurzame Energieproductie
DEI	Demonstratie Energie-Innovatie
HER	Subsidieregeling Hernieuwbare Energie
MIT	Subsidieregeling Mkb Innovatiestimulering Regio en Topsectoren
ERA-NET	Subsidieregelingen Europese netwerken slimme energiesystemen/zonne-energie
TSE	Topsector Energie Subsidieregelingen waaronder Urban Energy
PPS-toeslag	Publiek-Private Samenwerking toeslagregeling (uitgevoerd door TKI's)
TNO/ECN	Onderzoeksinstituut TNO waaronder ECN
NWO	Nederlandse Organisatie voor Wetenschappelijk Onderzoek

## Subsidies (2)

- Some major and minor changes will take place in 2019 & 2020
- More information on the variety of subsidy programs:  
<http://www.tki-urbanenergy.nl>
- An overview of current and finished projects:  
<https://projecten.topsectorenergie.nl/projecten>  
Or download the app (search for “TKI Urban Energy” in App Store or Google Play Store)

# Projects: EV in Urban Energy

- TKI Urban Energy & RVO supported > 20 EV projects
  - Power Matching City to the People (PMCttP://)
  - SEC USEF - Universal Smart Energy Framework (SEC USEF)
  - Smart Grid V2X Energy & Mobility (V2X)
  - Slim en Flexibel laden (SLIMFLEX)
  - Smart Charging TSE Urban Energy (SC)
  - High Tech Campus: the world's smartest grid! (HTC SG)
  - Onbalansreductie door het ontsluiten en slim laden van elektrische auto's in de blockchain (OROSL)
  - Emobility Communication & Information System Structure (ECISS)

# Challenges for the Urban Energy

- Electrification
  - Departure from natural gas, rise of heat pumps
  - Departure from fossil fueled cars, rise of electric vehicles
  - Decentralized energy sources (PV, wind)
- Challenges for the electric grid
  - Fluctuating energy sources destabilize the grid
  - Grid capacity under pressure due to peak demand
- Goal for 2030: The energy system in the built environment makes it possible that at least 20% of the local energy use (incl. EV) is generated sustainably within the built environment.

# Flexibility

- Flexibility gives the possibility to create a stable grid
  - Flex to balance the grid
  - Local flex to avoid grid congestions
- Using flex in the built environment creates a potential saving of € 270 million per year mitigating grid reinforcements.
- Flexibility from industry is not satisfactory!
- Flexibility from consumers and SME's is especially relevant to avoiding grid congestions.



# EV the core driver of flexibility?

- Technological
  - EV-suppliers, charge point operators and (some) commodity traders are already understanding the game (smart charging)
  - Protocols are in place (OCPP)
  - Smart 'maximized' charging and smart 'delayed' charging is in place
  - Vehicle2Building and Vehicle2Grid offer even more flex
  - Power and capacity of the flex
- Consumers
  - Relatively low impact on comfort
  - Useful vs. economic investment
- Suppliers of HP, PV and storage try to play the same game

# Routes for smart charging

- Consumer is the owner of flexibility
- Technical and economic services are needed
- Who will valorize the flex?
  - Connected car model
  - CPO model
  - EMS model
- Synergy with heat pump and solar energy
- Prevent lock-in

# Innovation challenges

- **Demonstrating market and earnings model** in unlocking local flexibility; often a business case is missing or is still marginal.
- **Consolidating results** from (previous) projects to make energy infrastructure more efficient and/or to realize an energy-neutral built environment;
- **Repeatability and scalability** of solutions with corresponding (international) standardization via reference architecture instead of point-to-point solutions; open-source protocols without lock-in and forced shopping for flex services, interoperability between the generation, purchase and storage points.
- **Privacy, cyber security and acceptable solutions** for residents. A critical success factor is the empathy with regard to the interests of users.

In 2019 app. €10 mln. is available for public-private innovation!

# Thank you!

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