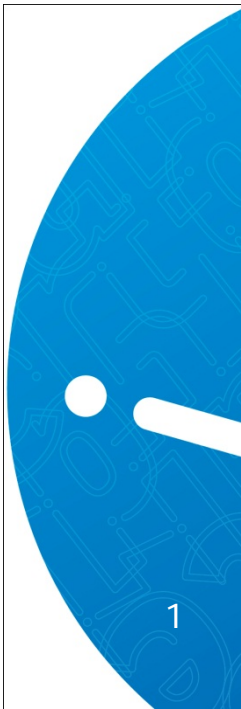


# Innovation in Electric Mobility in the Netherlands 2010 - 2020

## Combining the strengths of Dutch Technology, Design and Entrepreneurship

**Prof. Dr. Cees de Bont TU Delft  
Chairman of D-Incert**

**International Electric Car Conference  
November 2010 - Groningen**



## D-INCERT: Dutch Innovation Platform for Electric Mobility



## Innovation in electric mobility in the Netherlands

- **Is electric mobility interesting for the Netherlands ?**
- **What are the main drivers for electric mobility until 2020?**
- **What are the main challenges and innovations needed?**
- **Which innovation opportunities can be seized by Dutch companies, start-ups and knowledge institutes?**

## The Netherlands: good conditions for E-Mobility

- **A densely populated country: 16.6 M people, 400 /km<sup>2</sup>**
- **A densely populated urban region, the Randstad:**
  - **People: 7.1 M**
  - **1.535 people/km<sup>2</sup>**
  - **Average travel distance by car: 15-40 km/day**
- **Excellent infrastructure of roads, grids, public transport and ICT**
- **High level of education and high GDP/Capita**
- **Collaborative and entrepreneurial culture**
- **Pressures on quality of life in urban areas (air, noise, pollution)**



# E-Mobility Drivers 2010 - 2020



## Drivers for electric mobility in NL

- **Reduction of air pollution (NOx, fine particles) and improving environmental quality in densely populated areas**
- **Reduction of CO2 emissions of mobility and transport**
- **Security of energy supply (oil and gas)**
- **Greening of the energy production system (wind, solar)**
- **Economic growth and growth opportunities**



# E-Mobility Challenges 2010 - 2020



## Main challenges 2010 - 2020

- **Safe, reliable, comfortable, lower-cost, fit-for-use (PH)EVs**
- **Intelligent and safe charging technology and smart grids**
- **Transparent Total Cost of Ownership and payment structures**
- **Minimal environmental impact (PH)EVs over total lifecycle**



# Innovation opportunities 2010 - 2020

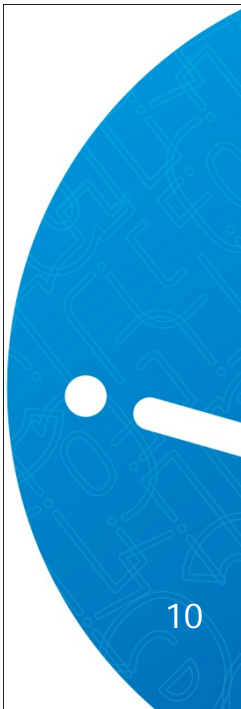


## Three innovation roadmaps

1. **Electric Urban Mobility**
2. **Clean and Convenient Energy**
3. **E-Mobility Services**

All innovation roadmaps are :

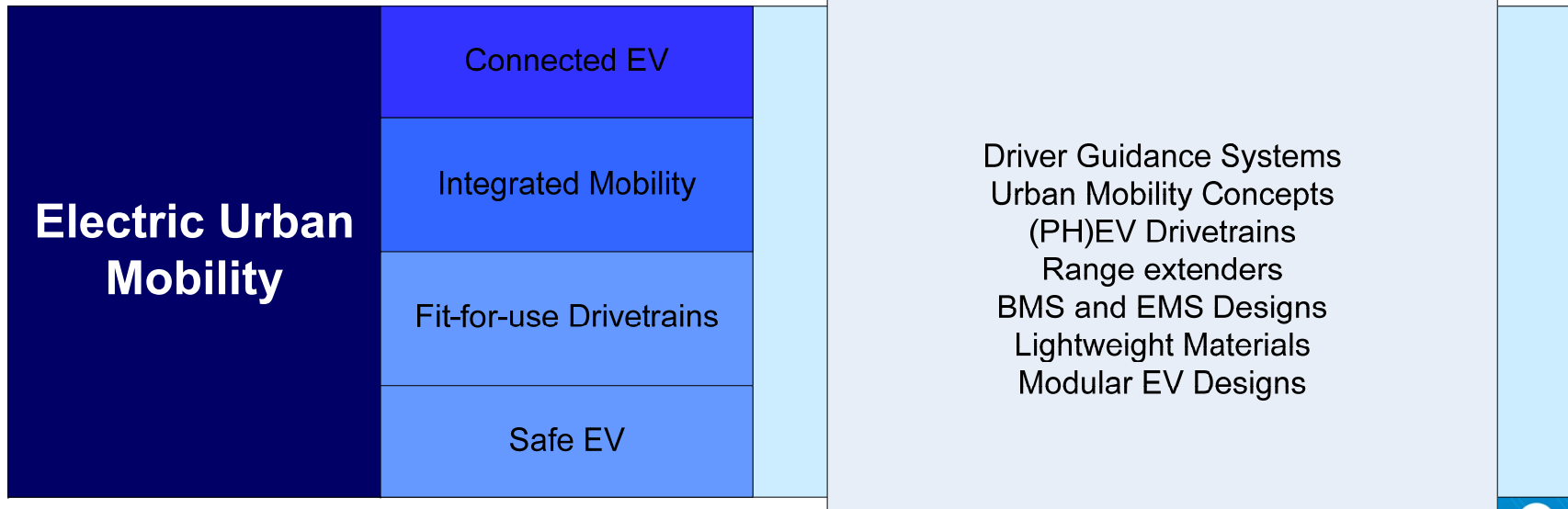
- **Interdisciplinary**
- **User-centered**
- **10-year focus**
- **Building upon technology and R&D competencies in NL**



# Electric Urban Mobility

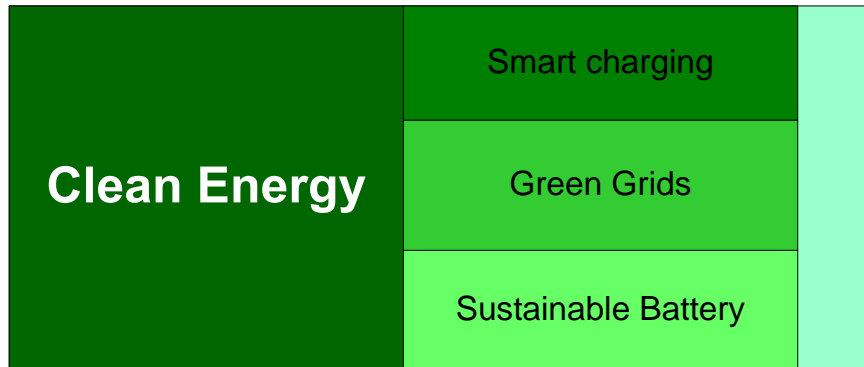
## INNOVATION TRACKS

## PRODUCTS and SERVICES

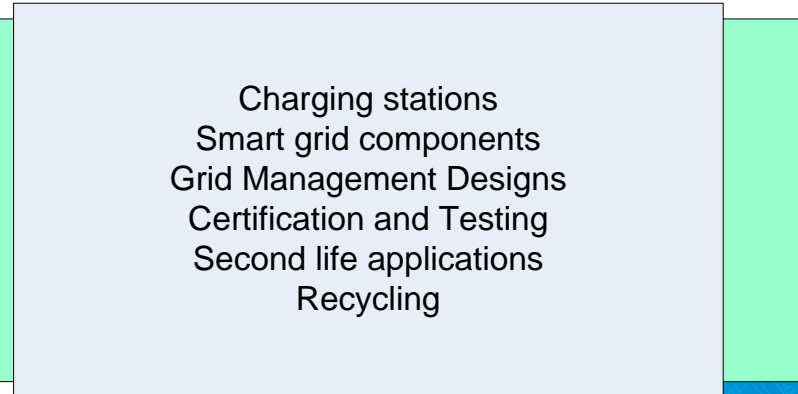


# Clean and Convenient Energy

## INNOVATION TRACKS

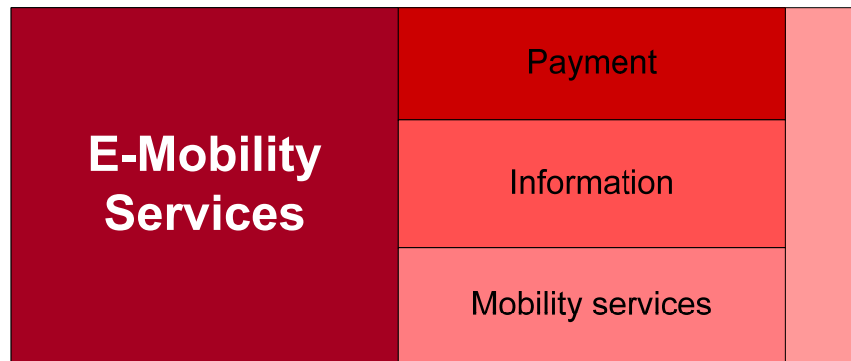


## PRODUCTS and SERVICES

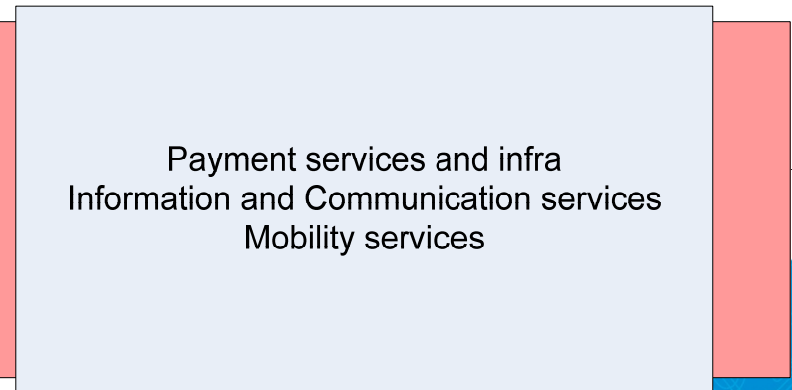


# E-Mobility Services

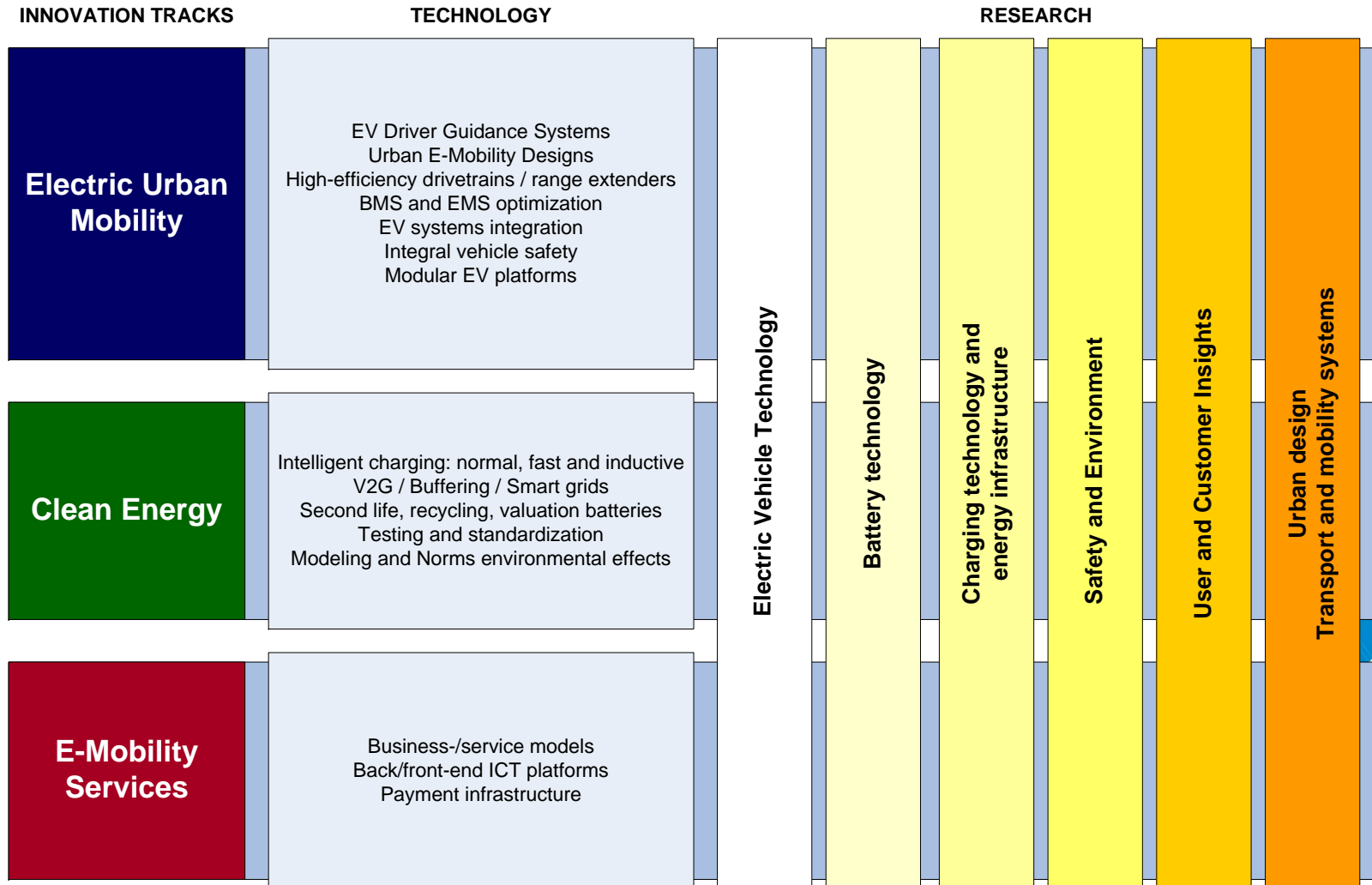
## INNOVATION TRACKS



## PRODUCTS and SERVICES



# Innovation, technology and research & development



## A call to action

- **Serious innovation opportunities for the next 10 years**
- **Opportunities for both start-ups and established companies**
- **Focus on urban mobility, energy infrastructure and services**
- **Strong competencies and R&D infrastructure in NL**
- **Strong networks and organizations, also at international level**
- **But the time is now and speed is key**
- **Already more than 80 companies and organizations active**

## And many more to come

AGV	Enexis	Flex-i-Trans BV	RAI/PDM
Alliander	Epyon	Innosys Engineering	RDW
ANWB	Essent	KEMA	Rotterdam DS+V
ARN	Essent New Energy	KVD	Rotterdam RCI
ATC	E-traction In Wheel motoren	Mirco Turbine Technology	Schiphol The Grounds
Athlon Car Lease	Exendis	MisterGreen Products BV	Siemens
Benteler Engineering Services	Formula Zero	MTT	Small Advanced Mobility
Better Place	Gemco	NAVTEQ	Spijkstaal Elektro
CE Delft	Gemeente Amsterdam	Nedcar	Stadsgewest Haaglanden
DAF	Gemeente Rotterdam	Newmotion	Stedin
DOET	Goudappel Coffeng	Nuon	SWOV
DTI	Grontmij	NXP Semiconductors	TNO
DURAB / ARN	HAN	PBL	TNO Automotive
ECN	Hogeschool Rotterdam	PEEC-POWER B.V.	TNT
Ecomovement	HTAS	Philips AppTech	TomTom International
e-laad	Imtech	ProRail	TU Delft
Eneco	Ing Bank	Punch Powertrain	TU Eindhoven
	Innopay	Q-Parc	Universiteit Twente



D-INCERT ACCELERATING INNOVATION

# ***CLEANER BETTER FASTER STRONGER***

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