



# Green Seminars

Inspiration • Learning • Action

Smart & sustainable cities as drivers for innovation

November 3-4, 2014

# Agenda

1. **Introducing Green Seminars:**
2. Demographic and consumption projections
3. From regulation to implementation via smart cities
4. Understanding the 'Smart city' notion
5. Six examples of smart city solutions

# Our reason for being

Green Seminars propagates and exports the "Danish energy model" to international cities.

The goal is to **help** local authorities **reducing CO2 emissions** in cities *and* spur green growth

# Sharing best practice...

By drawing on a pool of designated experts, Green Seminars **shares and transfers best practices,** technologies and administrative approaches to client cities.

# Viabile solutions

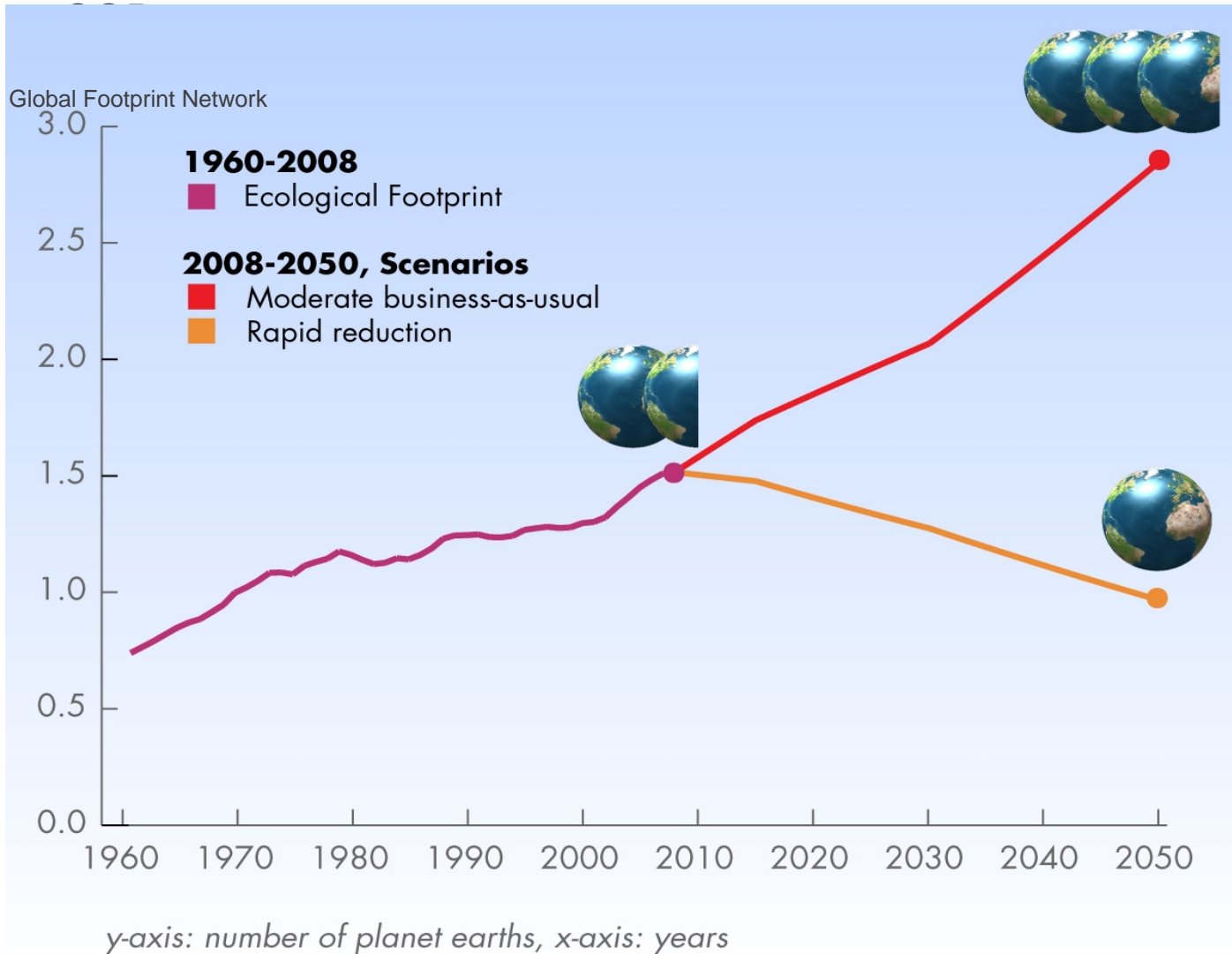
We render **system solutions** to client cities, which are both commercially **viable** *and* for the benefit of the **environment**

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## Anno 2014

- 70% of all energy is consumed in cities
- 7 bn people
- We consume 1,7 x what the Earth can reproduce
- In 2030 we will use 2 Earths UN-less the World agrees to change



## Challenges to any city anno 2050: Source: OECD, env. indicators.2012

- 9 bn people (+2 bn), UN stat.
- World economy grows 400%
- 70% of all citizens are urbanised
- We will consume 3 x what the Earth can reproduce







## **WATER RESOURCES STRAINED:**

**Freshwater availability will be further strained in many regions, with 2.3 billion more people than today (in total over 40% of the global population) projected to be living in river basins experiencing severe water stress**

**Global water demand 2050 is projected to increase by some 55%, due to growing demand from manufacturing (+400%), thermal electricity generation (+140%) and domestic use (+130%)**

Source: OECD

WE MUST CHANGE

WE NEED CHANGE

BUT

WE CANNOT CHANGE

UNLESS

THE CITIES TAKE THE LEAD AND GO SMART!!!

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## Where to intervene?

2050:

- 80% of all energy is consumed in cities
- 80% increase in energy consumption
- Already today buildings consume 40% of all energy
- If climate and energy policies remain unchanged current fossil fuel based in the global energy mix will still remain at about 85% in 2050

Source: OECD, env. indicators 2012

A propagation of **smart cities** is a prerequisite for a successful energy planning as it is featured in the *Danish Energy Model*:

**EU2020 & 2030 Framework:**

2020: CO2-20% (ETS); EED-20%; RES-20%; Transport-10%  
EU2030: -40% CO2; 27% RES; 27% EE

**National targets 2020 & 2035 & 2050:**

2020: CO2 – 40%  
2035: Fossil free energy  
2050: 100% fossil free

**City level implementation:**

Energy efficiency;  
Buildings; Renewables; Transport;  
NON-ETS Industry  
& Farms

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# Smart Cities

“In Smart Cities,  
digital technologies translate into  
better public services for citizens,  
better use of resources and  
less impact on the environment”

<http://ec.europa.eu/digital-agenda/en/smart-cities>



**WE NEED TO PLAN MORE SMART AND AVOID TO SPEND THE MONEY TWICE !!!**

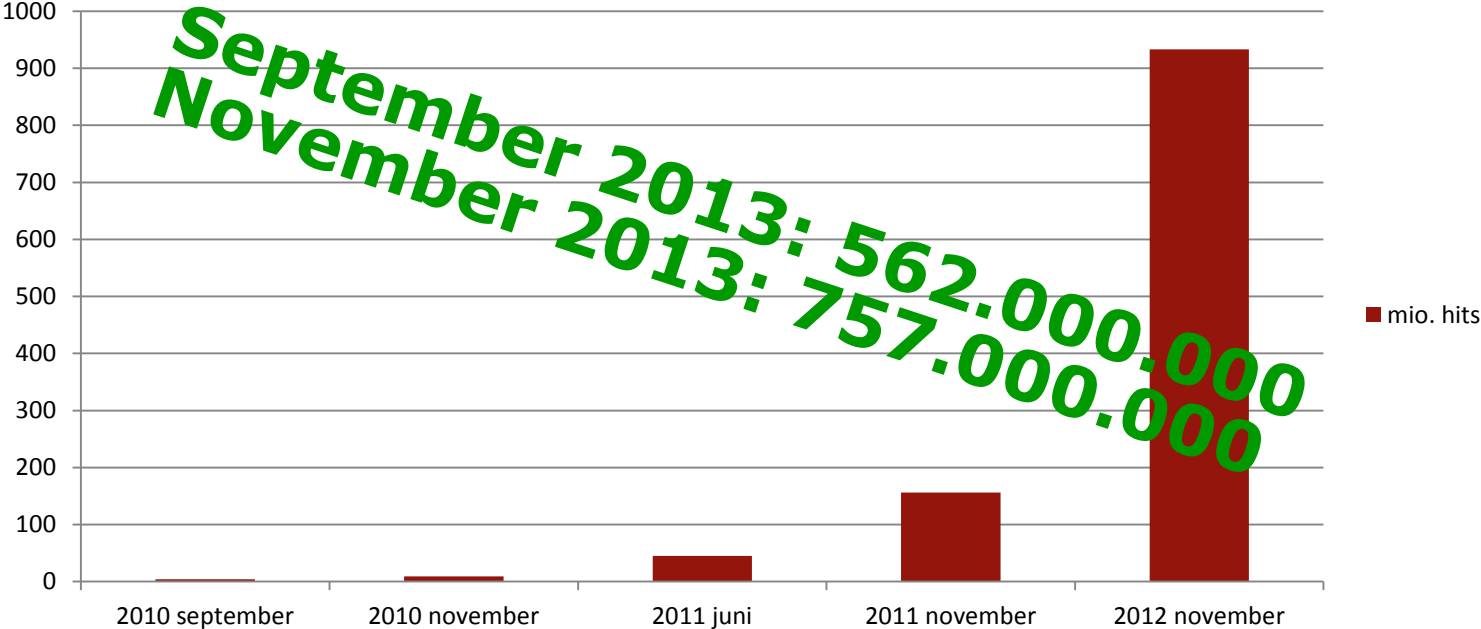


**RESOURCE EFFICIENCY IS ACHIEVEABLE THROUGH SMART SOLUTIONS  
AND MUST BE IMPLEMENTED IN ANY SMART CITY**





# 'Smart City' Google hits









Cities are at different levels however they all feature the need for guidance, even at the **Covenant of Mayors** (CoM), which is the mainstream European movement involving local and regional authorities, voluntarily committing to **increasing energy efficiency** and **use of renewable energy sources** on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO<sub>2</sub> reduction objective by 2020.

- **More than 6,100 signatories mainly within the EU**
- **900 cities suspended**
- **Three + one categories:**

A: Ambitious and ready to act or already implementing

B: Prepared to challenge themselves by embarking on new commitments

C: Not ready to commit however thrilled by the *hype* and 'excitement'

+

D: Suspended, scrutinized and exposed



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# 1. Transportation



FLIR  
2. Buildings



e.g. energy efficiency from retrofitting during renovation of buildings





### 3. Renewables



## Solceller indviet på rådhusets tag



Hillerød: Med to års forsinkelse er Rådhuset. Projektet blev sparet

Læs hele artiklen i [Sjællands](#)





## 5. Industrial Symbiosis

### Water – Energy nexus

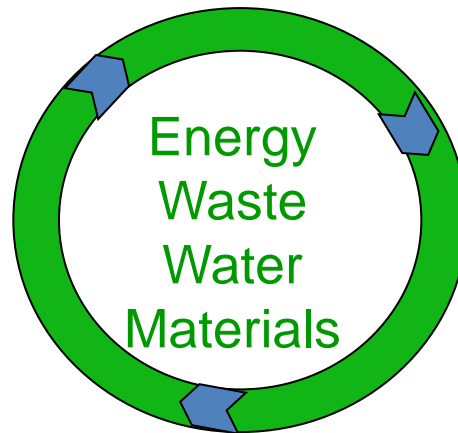
**Price on electricity has dropped dramatically**

**There is currently abundant electricity**

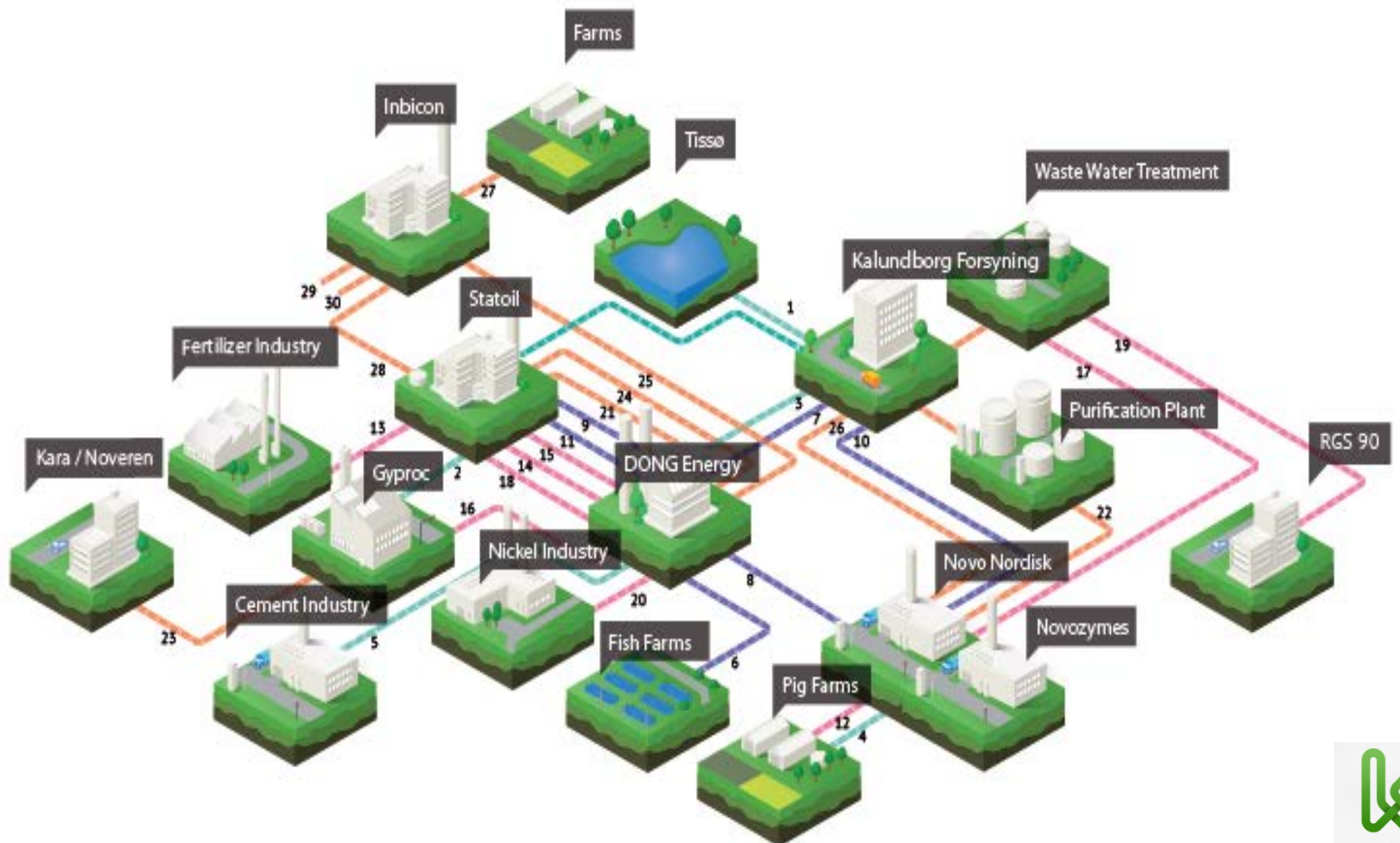
**We need to focus on heat and water however these can not be treated separately as electricity is an integral part of e.g. CHPs**

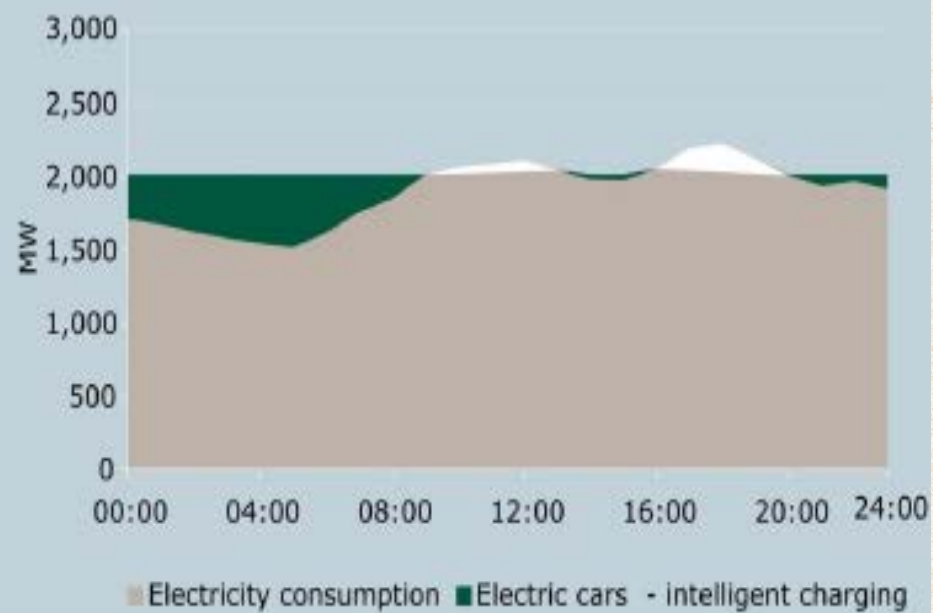
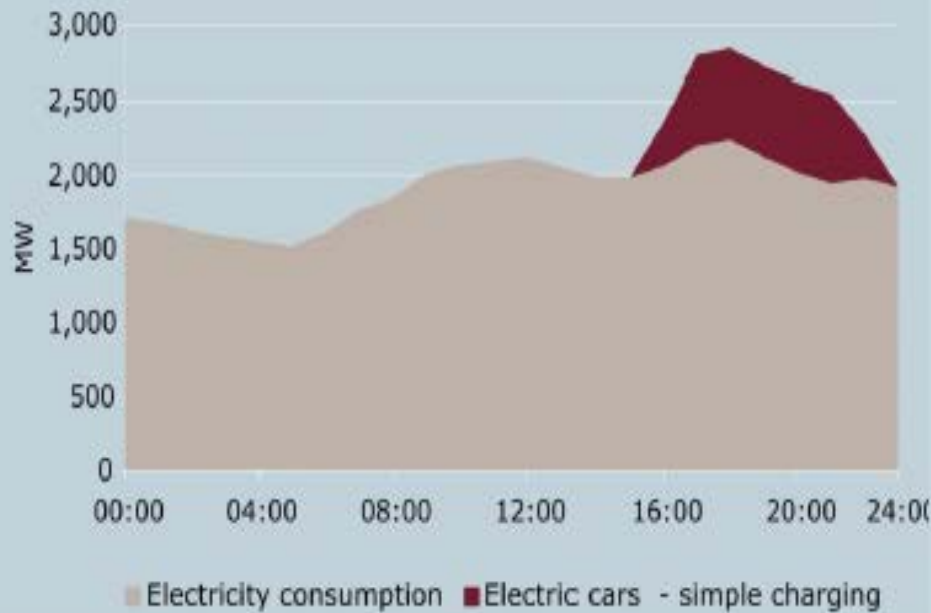
Industrial Symbiosis as a notion was conceived in Kalundborg.

*4 R's*



# KALUNDBORG INDUSTRIAL SYMBIOSIS SYSTEM 2012





## 6. Ageing population

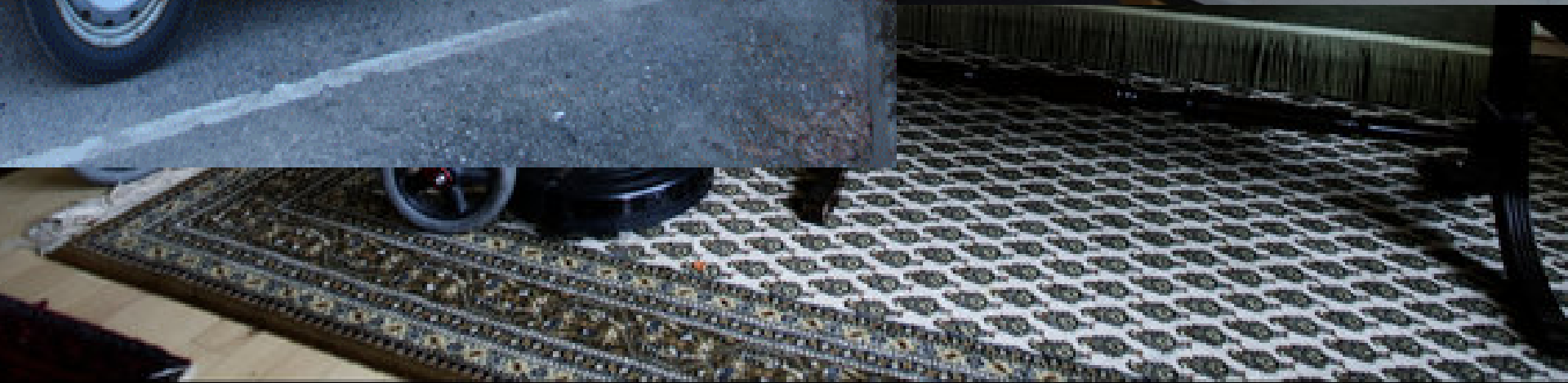
**Challenges to any city anno 2050:**  
OECD countries 25% of population over 65 vs 15% 2012

Source: OECD, env. indicators 2012











Thank you for your attention 😊

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## Examples of smart city innovations:

1. **Transportation**
2. **Buildings**
3. **Renewables**
4. **Coherent city planning**
5. **Industrial Symbiosis e.g. water – nexus energy**
6. **Ageing population**