

SEMIZENTRAL:

An integrated infrastructure concept for fast growing urban areas



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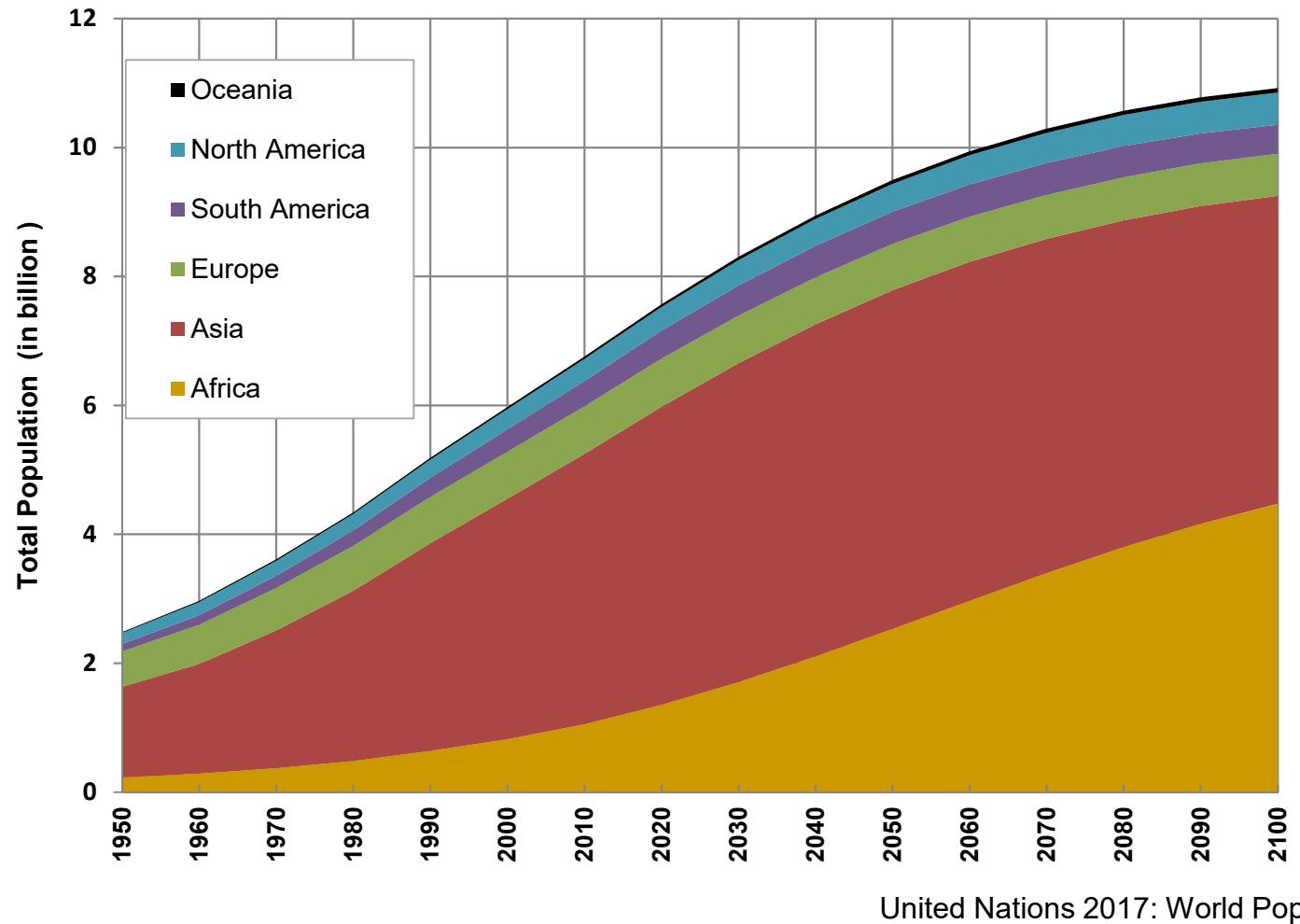


Federal Ministry
of Education
and Research



SEMIZENTRAL
GERMANY

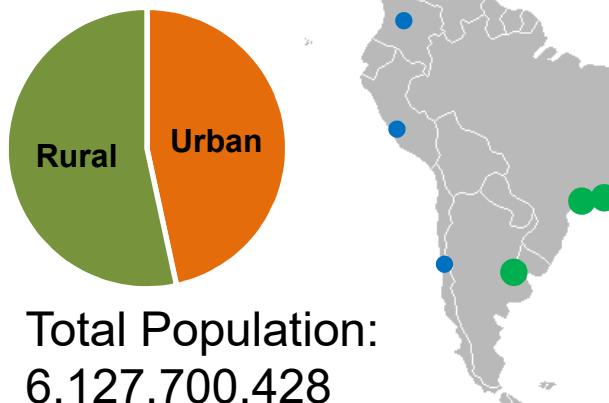
Challenge 1: World Population Growth



Challenge 2: Urbanisation

2000

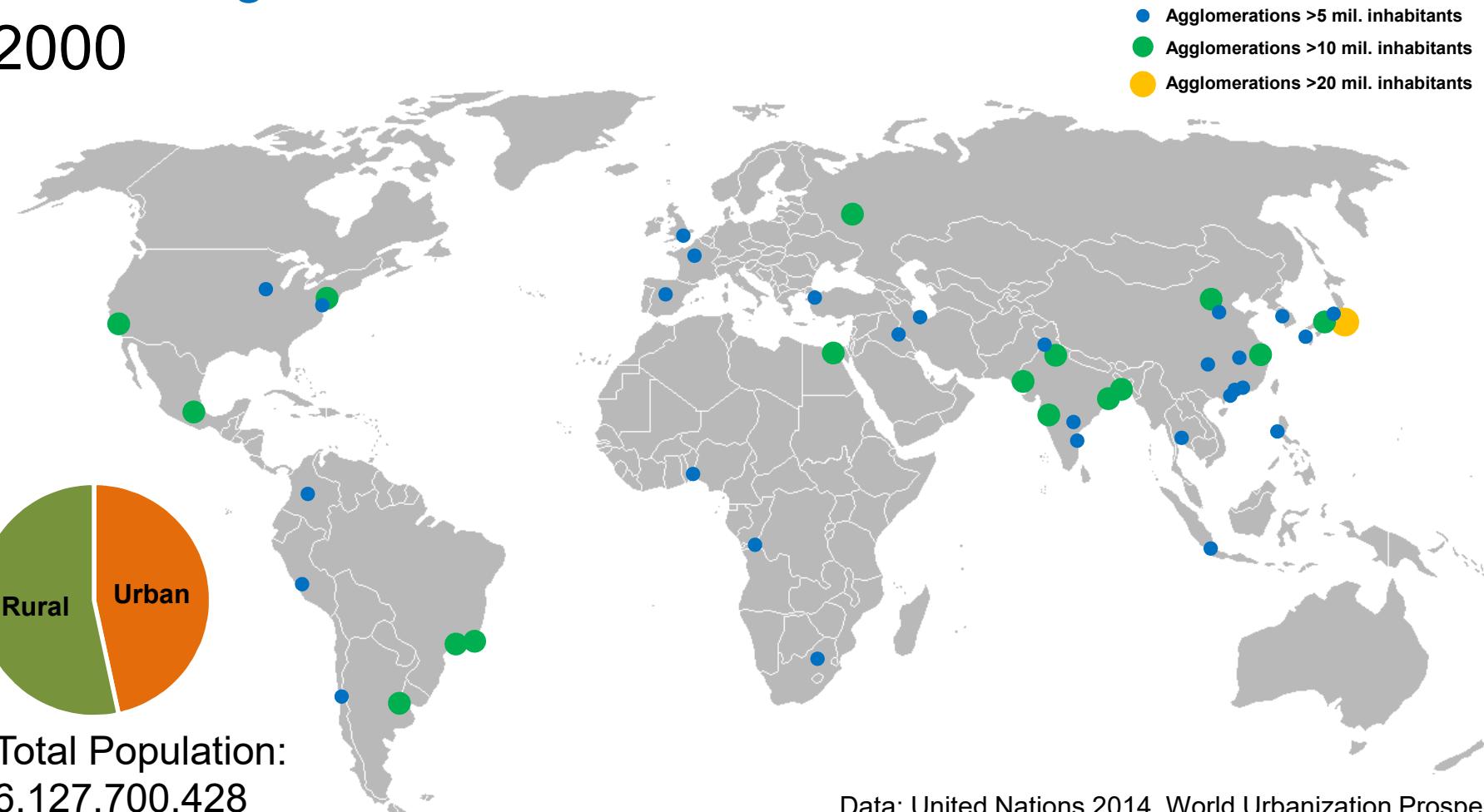
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10/23/2018

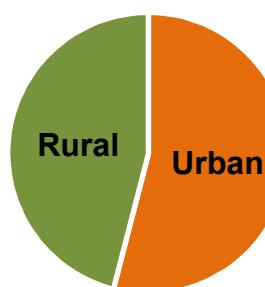
Prof. Dr.-Ing. Martin Wagner, Institute IWAR, TU Darmstadt

3



Challenge 2: Urbanisation 2015

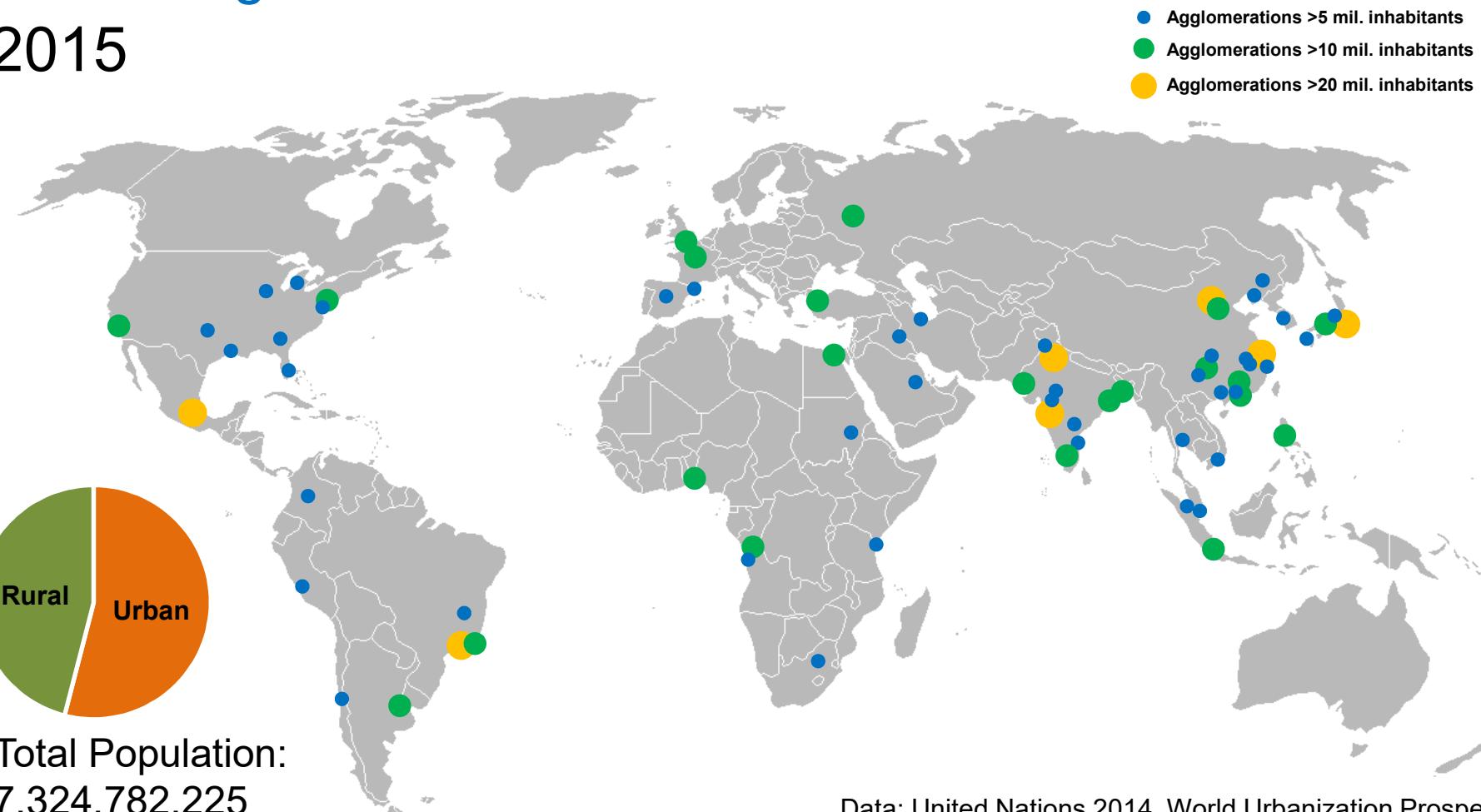
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Total Population:
7,324,782,225

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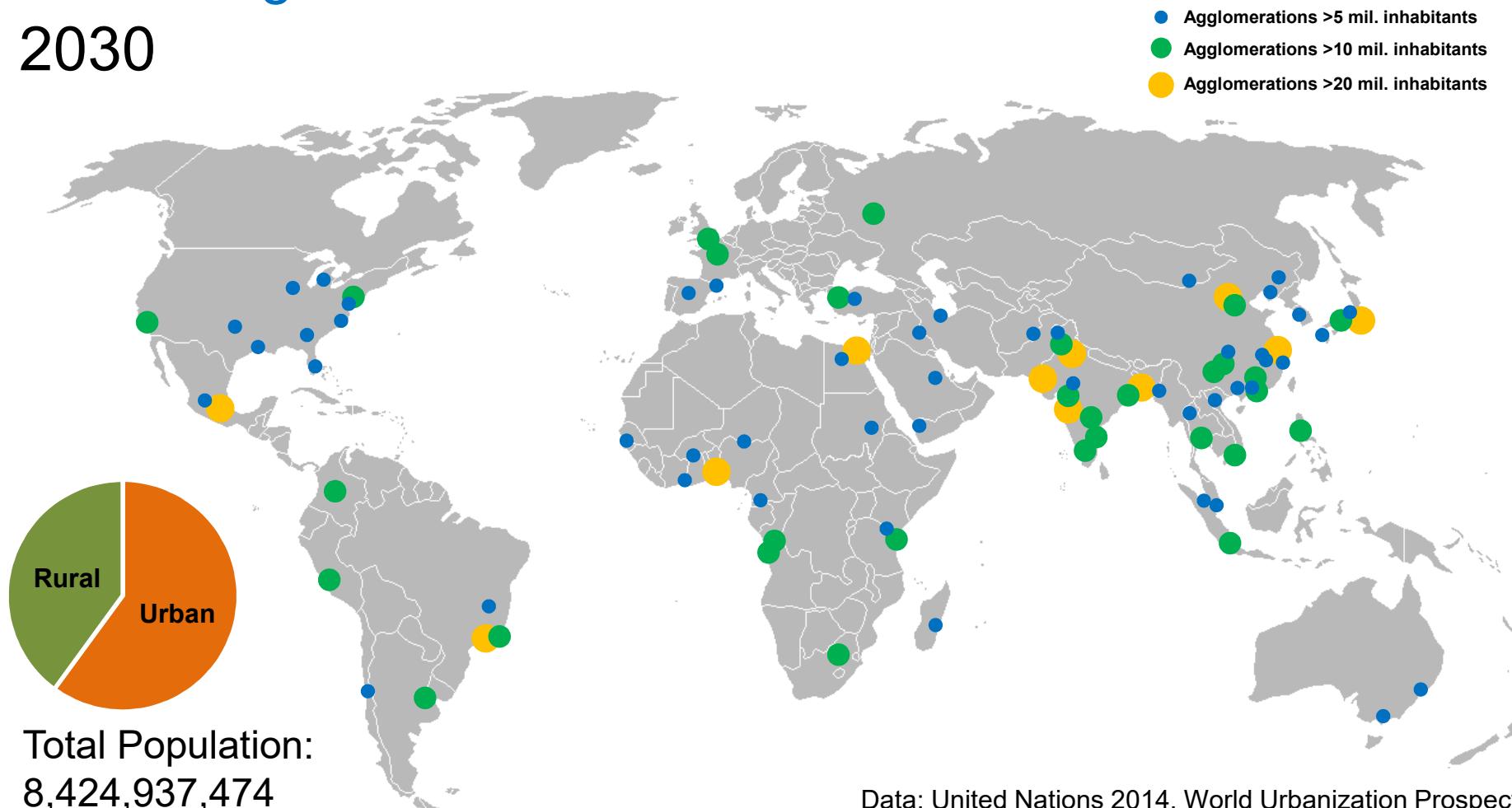


Data: United Nations 2014, World Urbanization Prospect

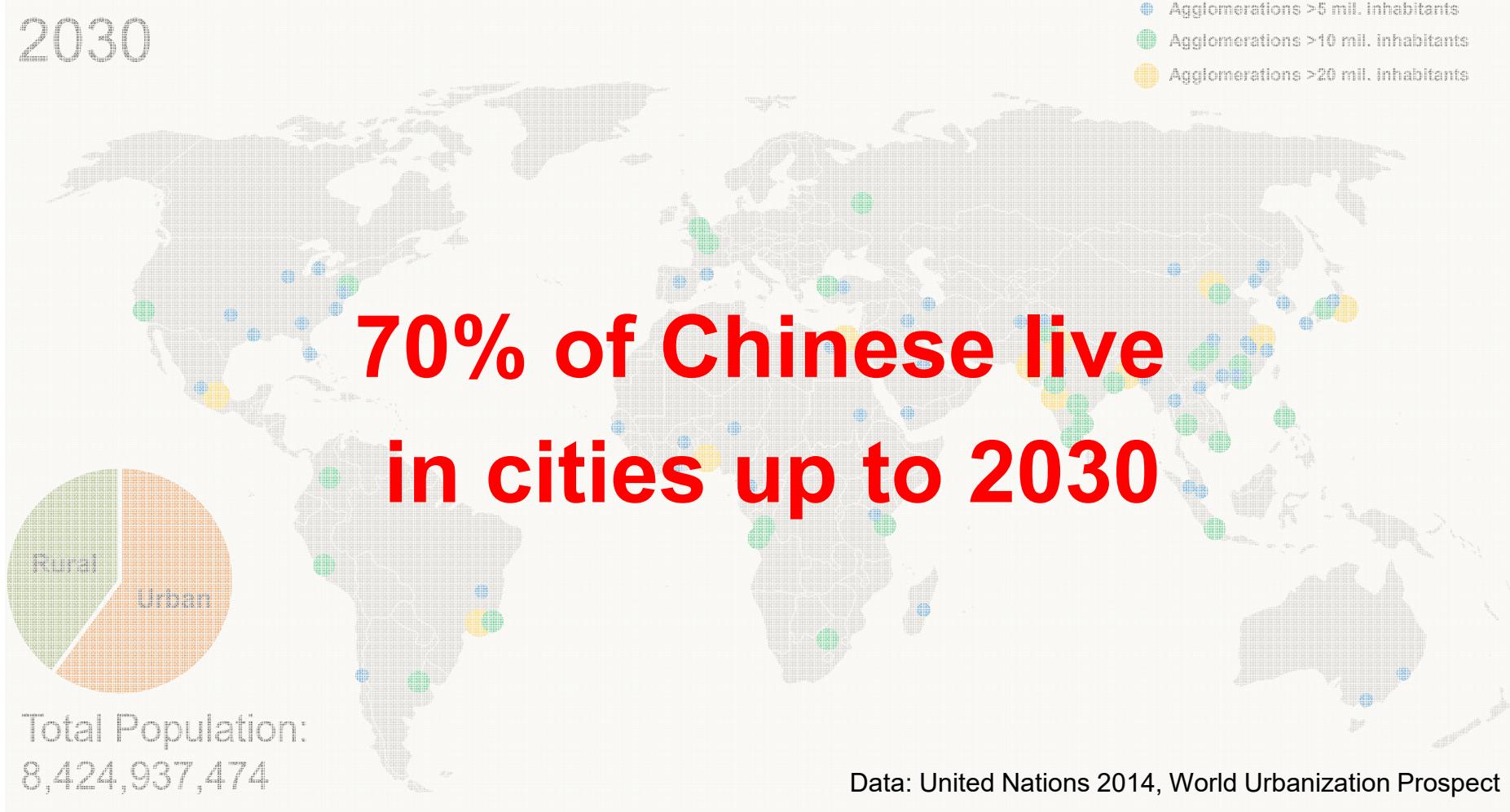
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Challenge 2: Urbanisation

2030

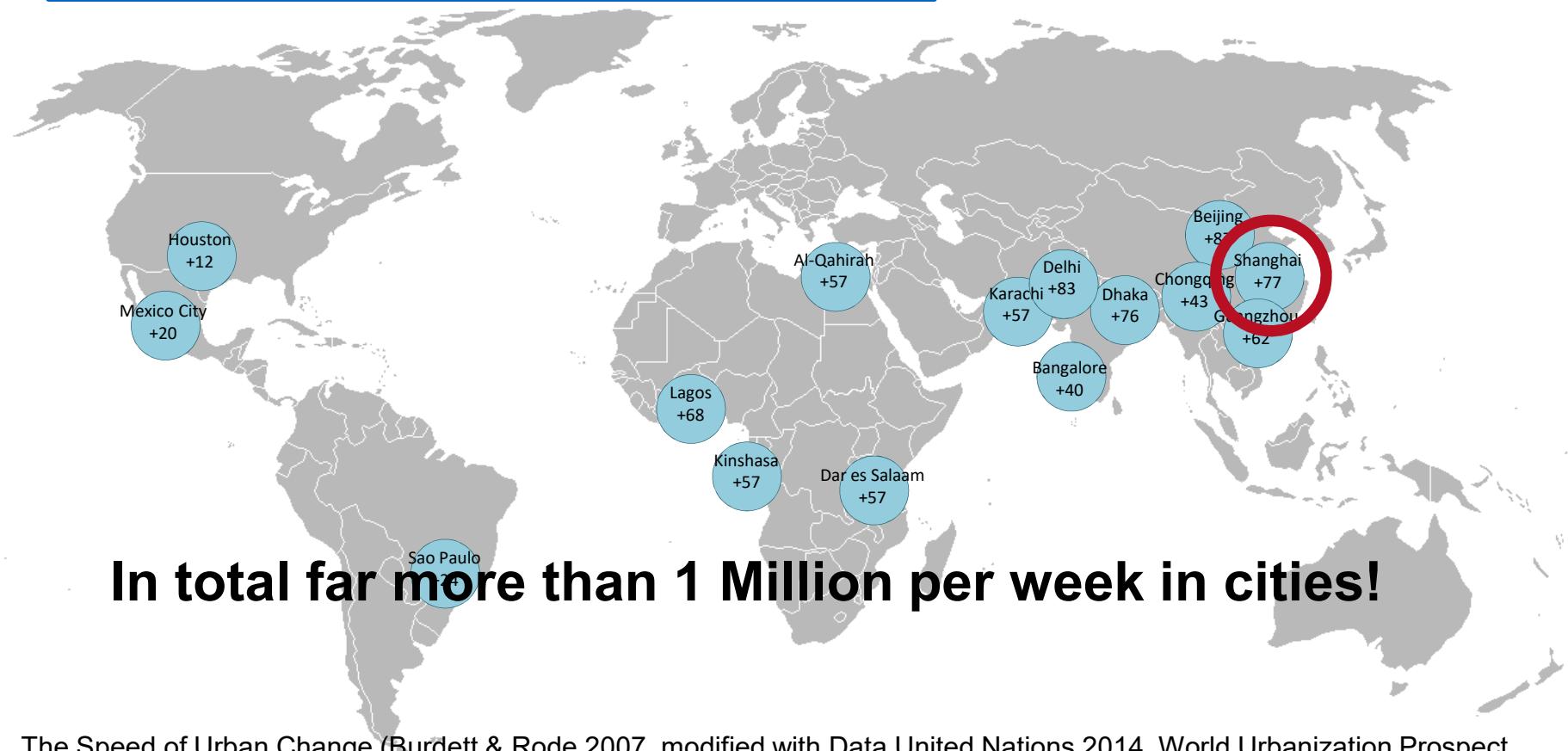


Challenge 2: Urbanisation



Challenge 3: Dynamic of urban growth

Example of Shanghai: 77 C/h > 675,000 C/y



The Speed of Urban Change (Burdett & Rode 2007, modified with Data United Nations 2014, World Urbanization Prospect

Growth rates, e.g. Shanghai



Population growth

77 C/h → **675,000 C/y**

Additional water

132 L/(C·d) → **32,500,000 m³/y**

Additional solid waste

1 kg/(C·d) → **245,000 tons/y**

Challenge 4: Limited Resources & Environmental Pollution

Water



<http://www.geo.de>, 2013

Energy



<http://www.hvv-mobility.com>, 2013

Nutrients (e.g. Phosphorous)



www.baecktrade.de, 2013

Pollution

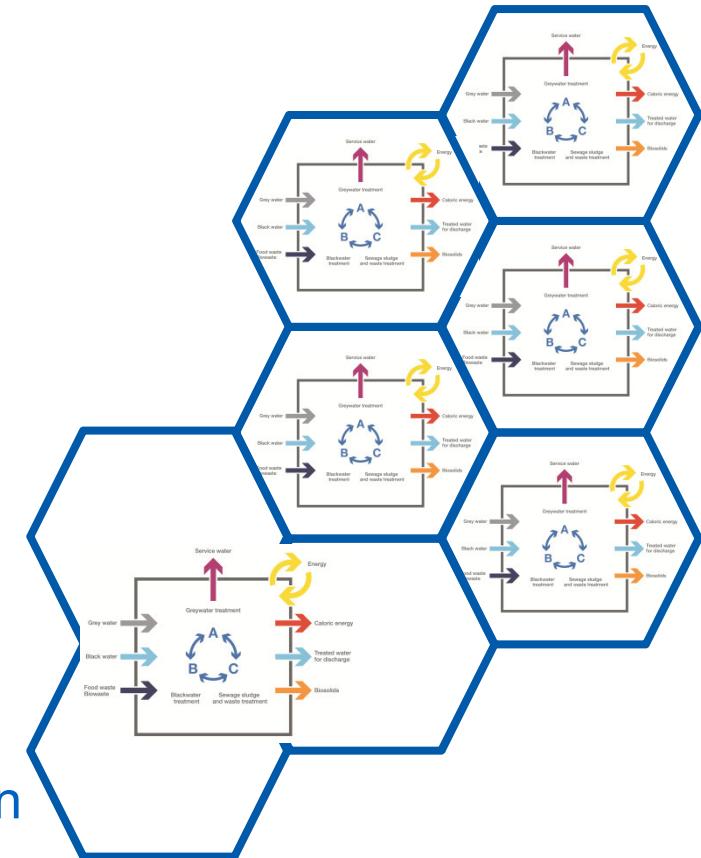


<http://www.nytimes.com>, 2013

SEMIZENTRAL: Integrated treatment on district level

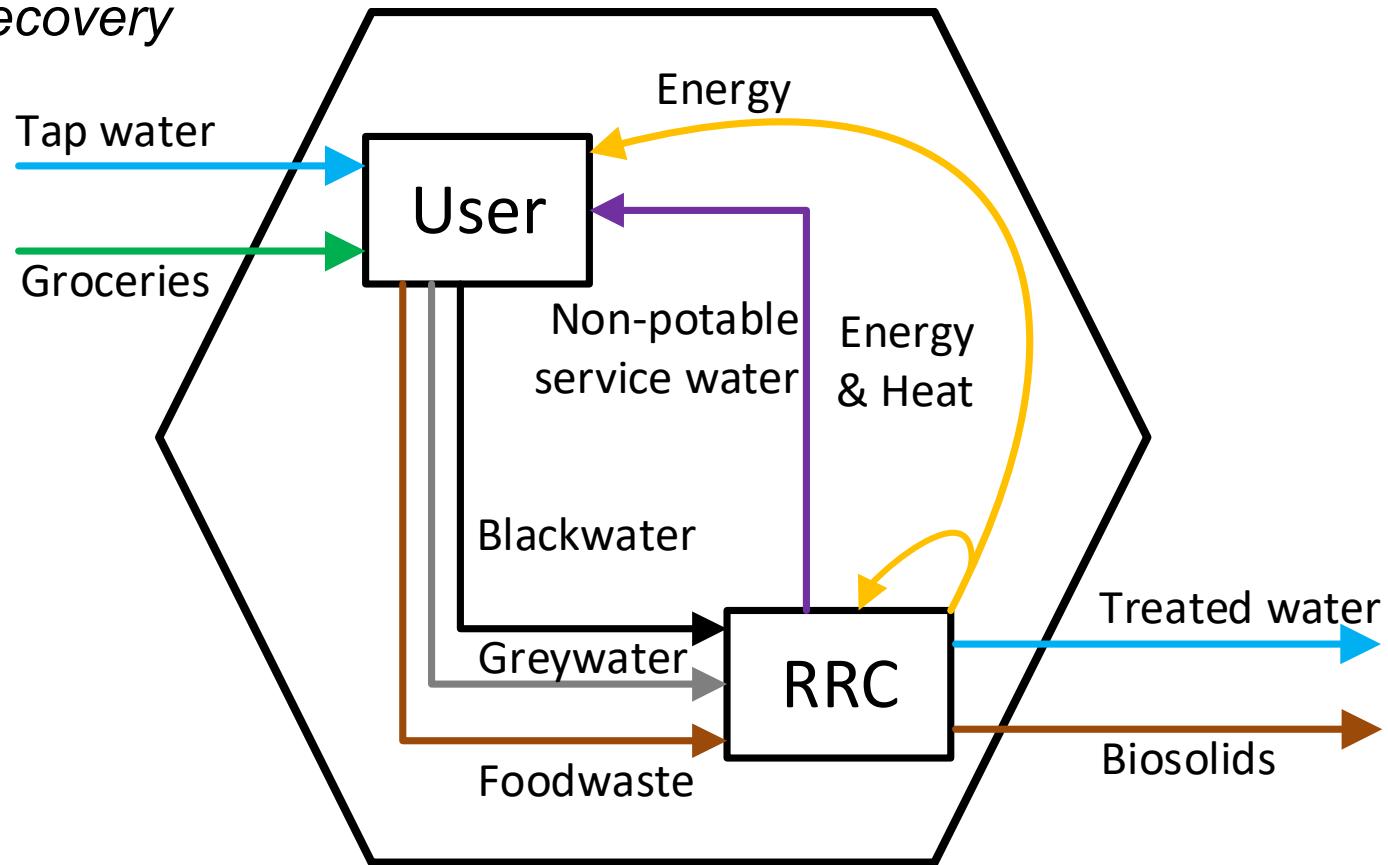
Semizentral contributes to “Smart Cities”:

- **Growth of population and urbanisation**
 - Adaptable to growth rate
 - Flexible
 - Adjusted
- **Environmental Pollution and Scarcity of resources**
 - Integration of the sectors wastewater, waste water and energy
 - Production of service water (toilet flushing, irrigation, ...) and biosolids for agricultural use
- **Enclosed construction ensures low-emission**



SEMIZENTRAL: Integrated treatment on district level contributes to “Smart Cities”

Close the loop of urban water and energy demand and production via resource recovery



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