

Building Smart Cities for the Future

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Lisbon, November 30th 2016



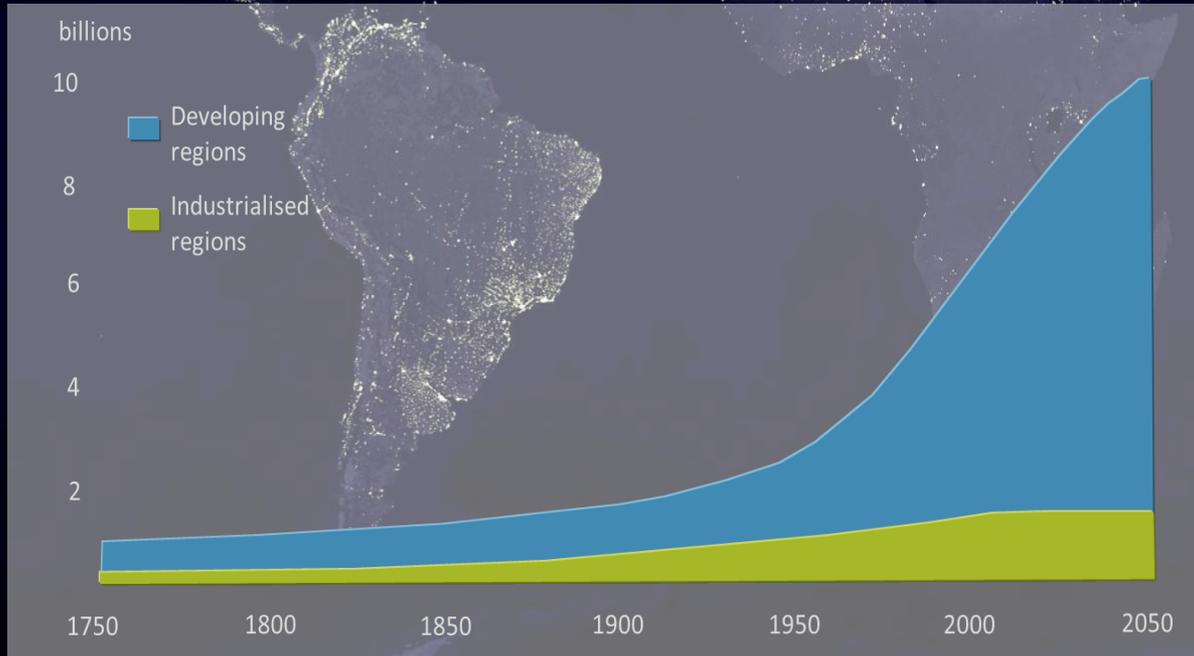
Synopsis

Societal challenges are genuinely vexing, and we cannot shy away from them. They are best addressed where people are – in cities, that are 'smart'. The first wave of smart cities has taught us much about how to bring digital transformation to physical and human systems.

- **Context**
- “Wave 1” Smart City Learning
- Opportunities for the future



Two things that hold my own attention



A morning quiz...

If a drop of water was put in the middle of the stadium at 12 noon on Saturday and every minute the volume doubled, when would the stadium overflow?

12.49

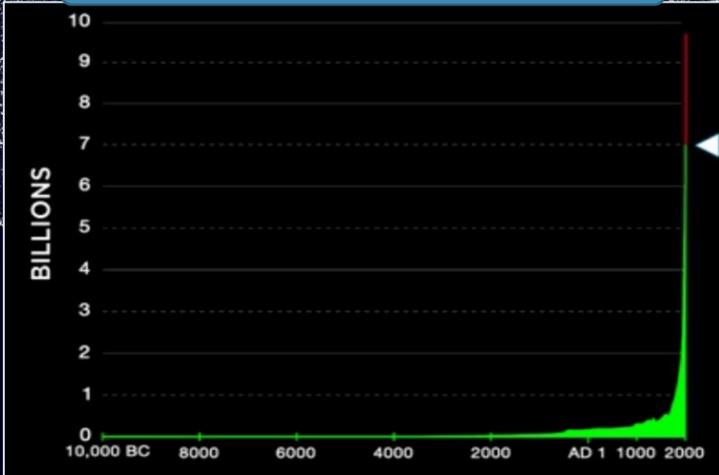
And when would it be 95% empty?

12.45

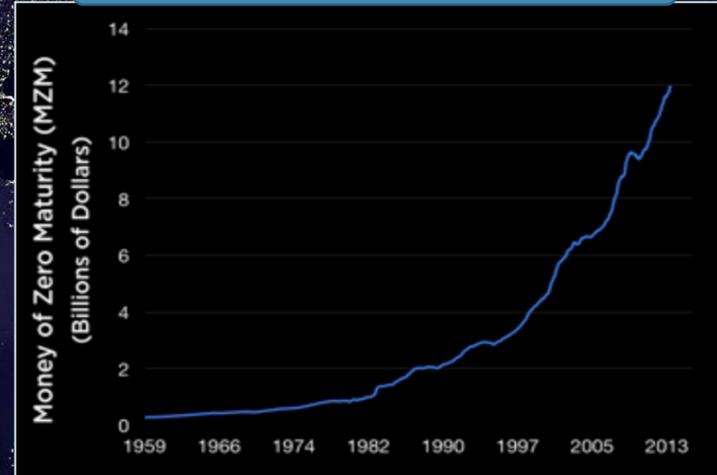


“The greatest shortcoming of the human race is our inability to understand the exponential function” Dr Albert Bartlett

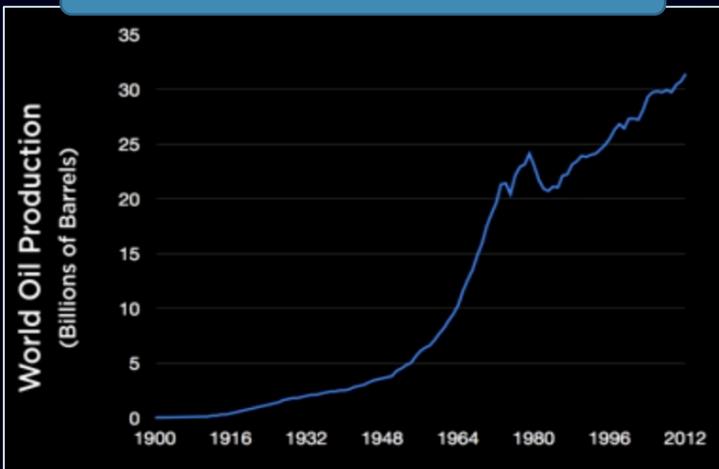
Global Population Rise



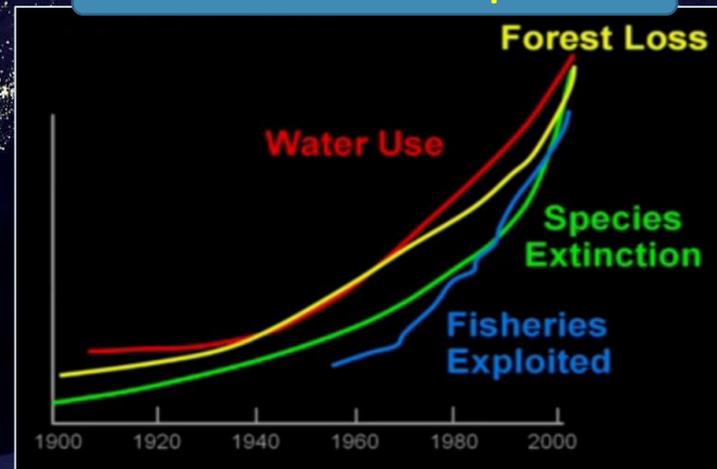
Money Printing



Oil Production

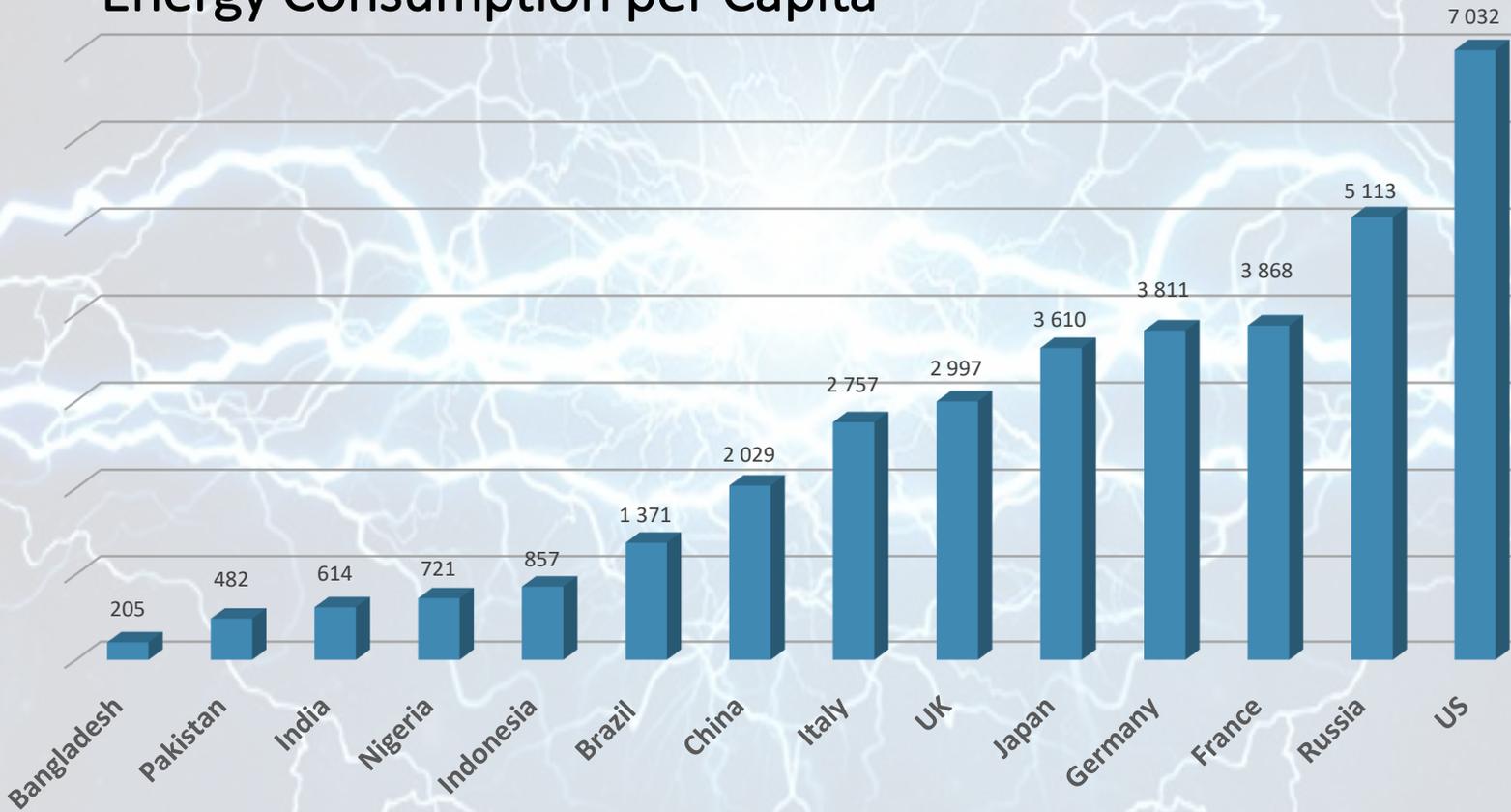


Natural Resource Depletion



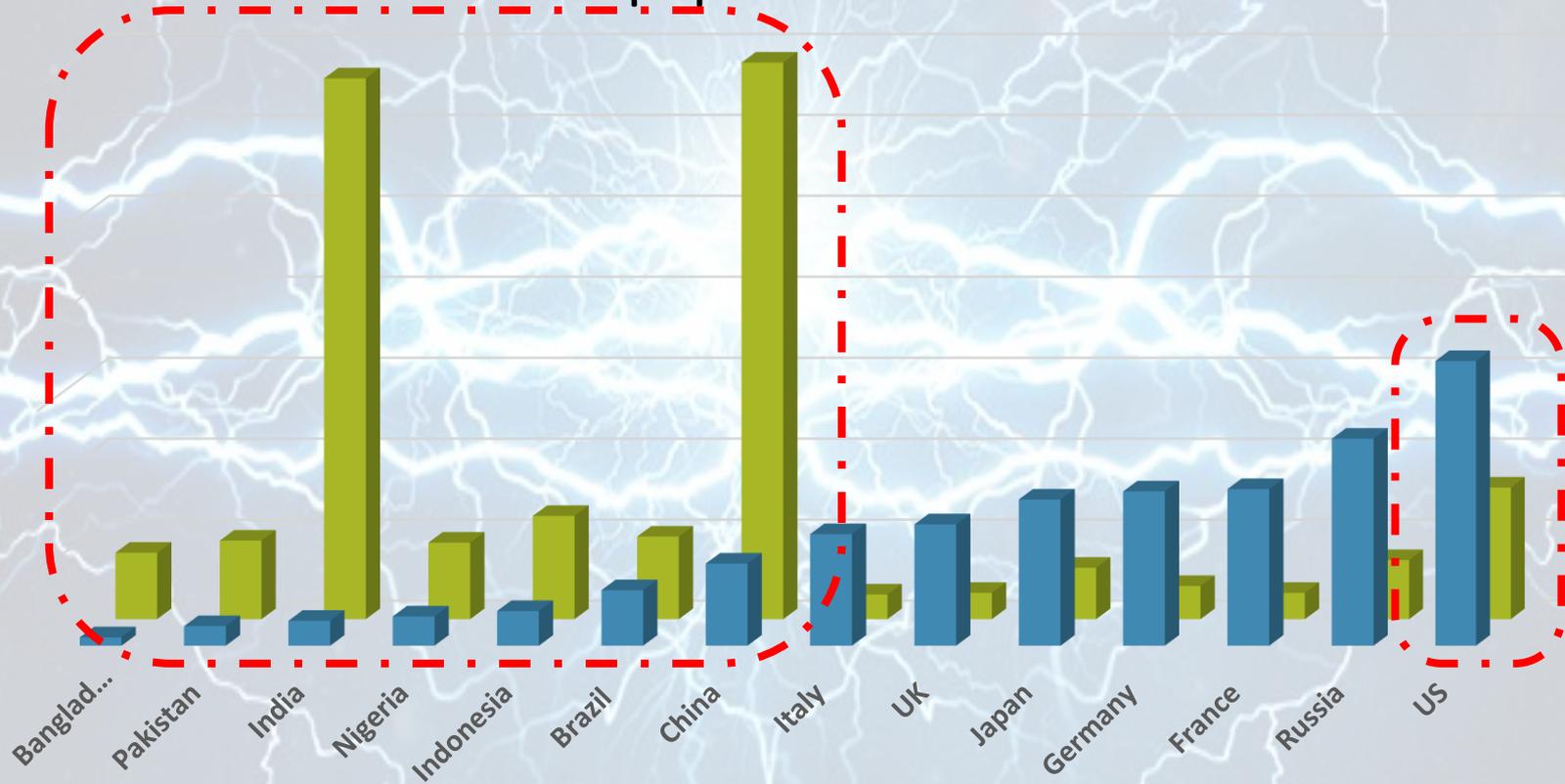
Let's take energy...

Energy Consumption per Capita



Let's take energy...

Same data – now with population



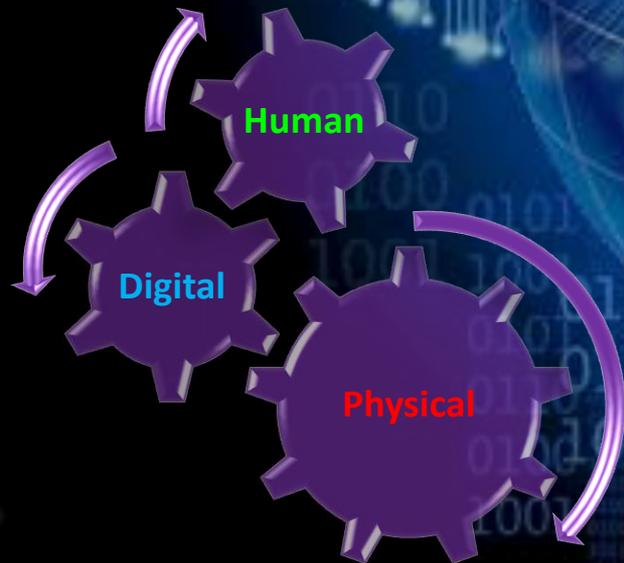
...worrying?
(how) does the maths work out?



The accelerating growth of cities, and their disproportionate consumption of physical and social resources, is assessed by the United Nations to be the greatest challenge to mankind since we became social

Our challenge then is to re-imagine how *human*, *physical* and *digital* systems can come together in new ways

...that'd be 'smart'!



...& cities can lead the way!

- Context
- **“Wave 1” Smart City Learning**
- Opportunities for the future



When I say 'smart city' I mean...

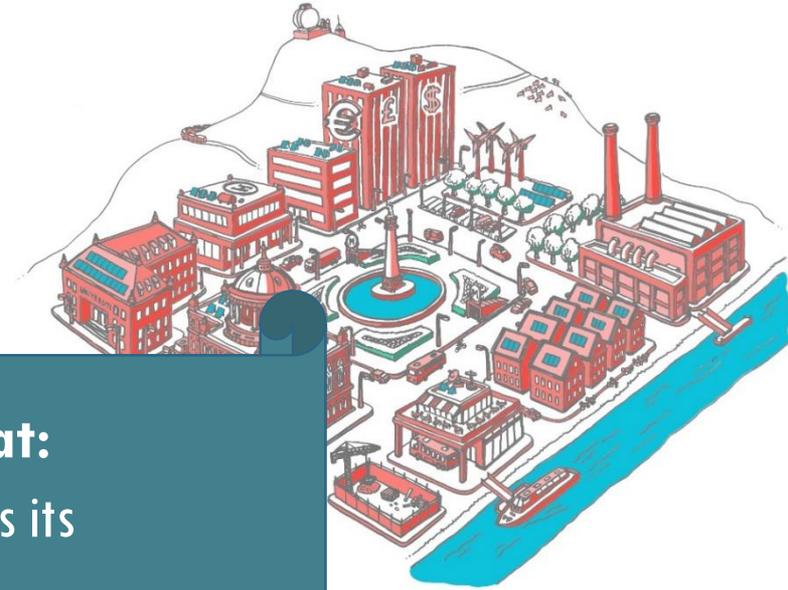
a call to action

A “Smart City” should be described as one that:

...dramatically increases the pace at which it improves its sustainability and resilience,

...by fundamentally improving (i) how it engages society, (ii) how it applies collaborative leadership methods, (iii) how it works across disciplines and city systems, and (iv) how it uses data and integrated technologies,

...in order to transform services and quality of life to those in and involved with the city (residents, businesses, visitors)

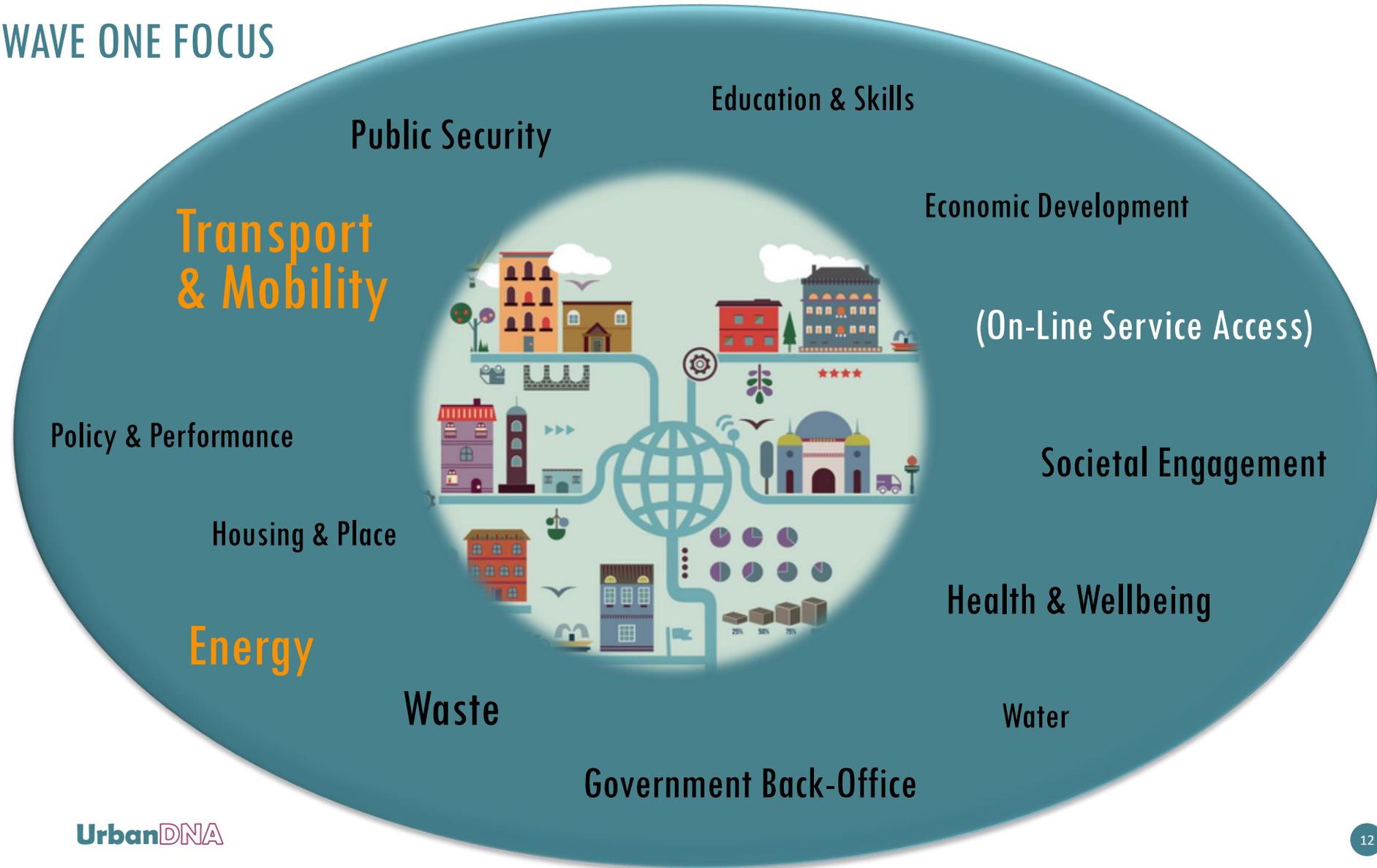


4 key features

ISO Definition, 2015

Wave 1: where's the attention been placed?

WAVE ONE FOCUS

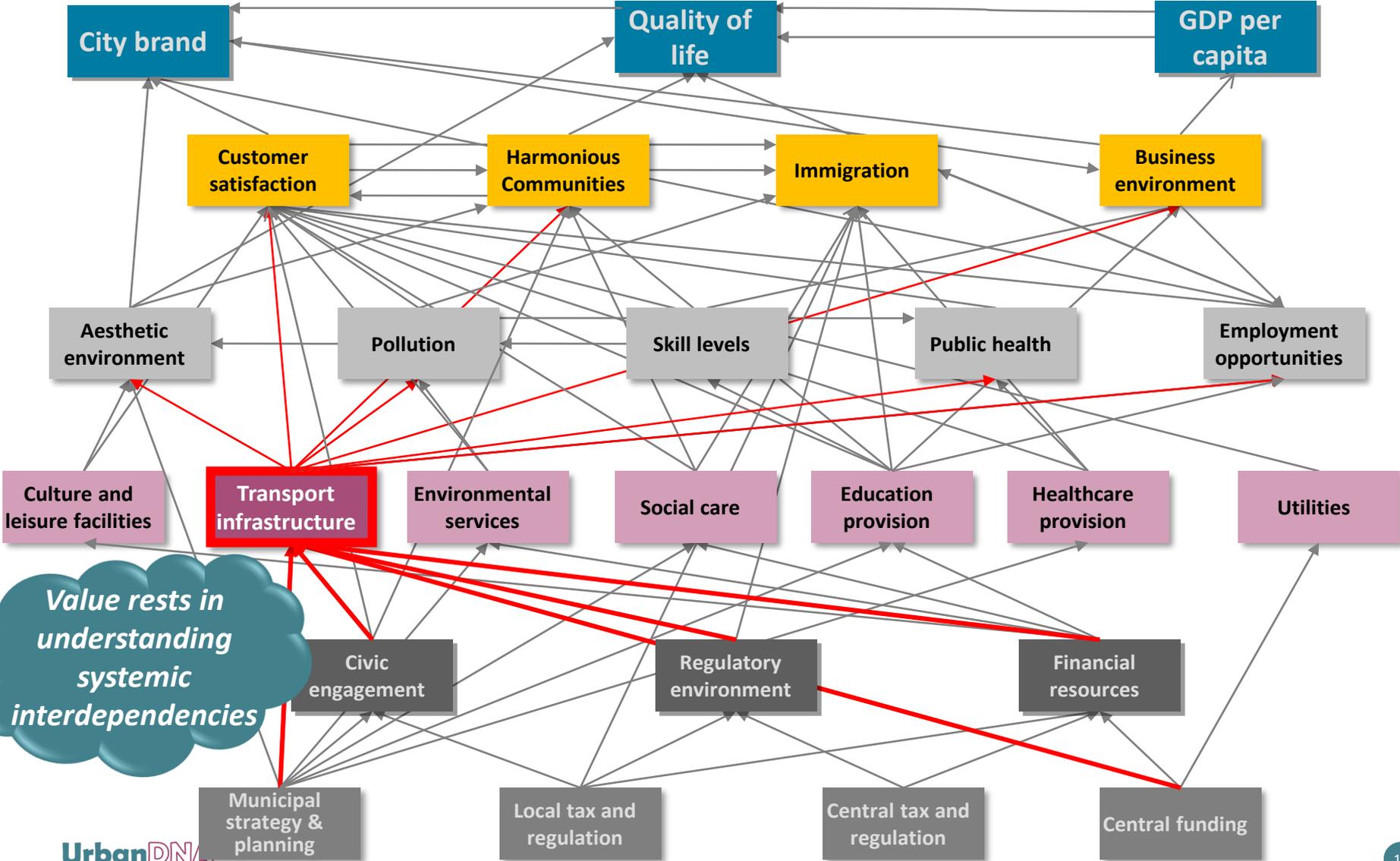




So what have cities learned?

7 key messages

Cities are just inherent complexity



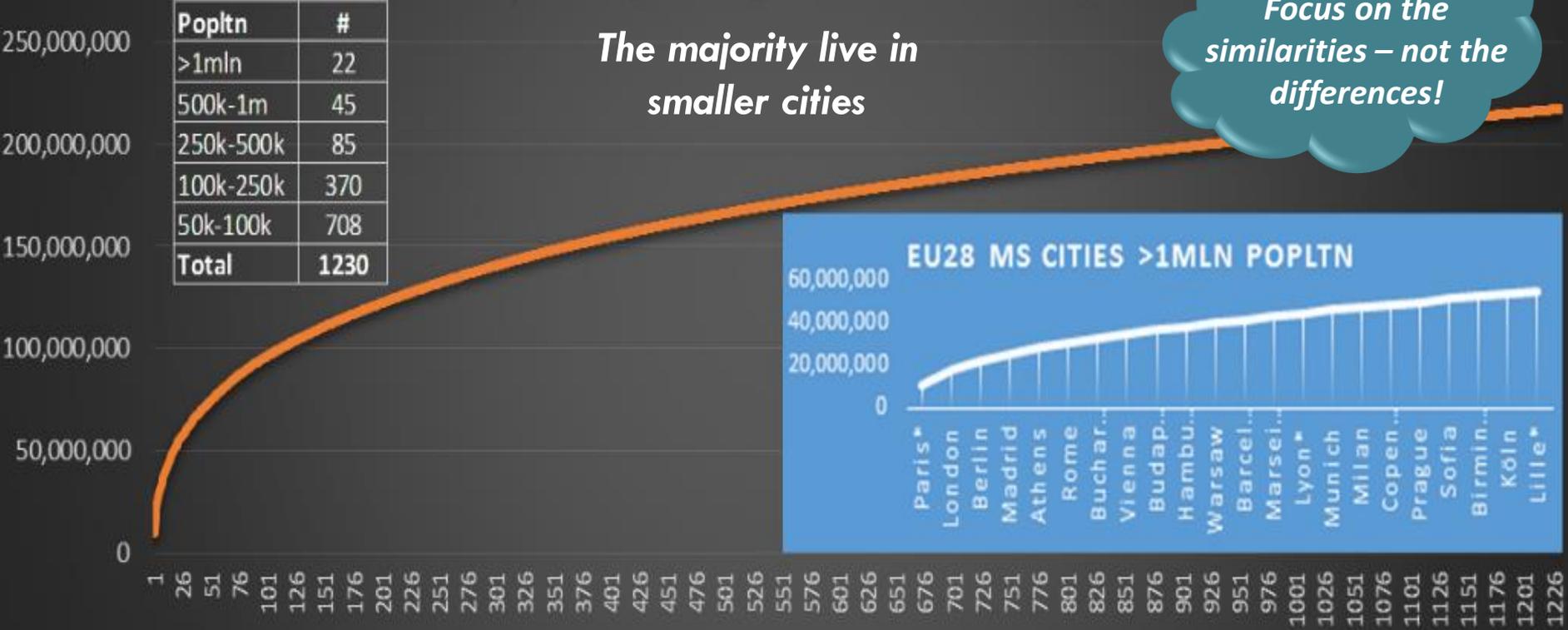
We've rather neglected the mid & smaller cities

European (EU28) Cities >50k Popltn

Popltn	#
>1mln	22
500k-1m	45
250k-500k	85
100k-250k	370
50k-100k	708
Total	1230

The majority live in smaller cities

Focus on the similarities – not the differences!



...they all face similar challenges; yet struggle to influence the market
→ **Collaboration & "Demand Aggregation"** address this

No smart city without smart leadership

...and the commitment and mechanisms to sustain it!



Someone asked me the other day if I knew of a really great example of a smart city plan

FRANKENSTEIN

No More
Pilots!

*Antoni Vives; Deputy Mayor,
Barcelona 2013*



Clear gaps exist in the market

Investors



- Business models & financing structures that incentivise action and aggregation.
- Earlier involvement (& more technical understanding).

Industry



- Less 'push' – more listening
- More collaboration / 'ecosystems'



Society



- Greater participation and accountability

Cities



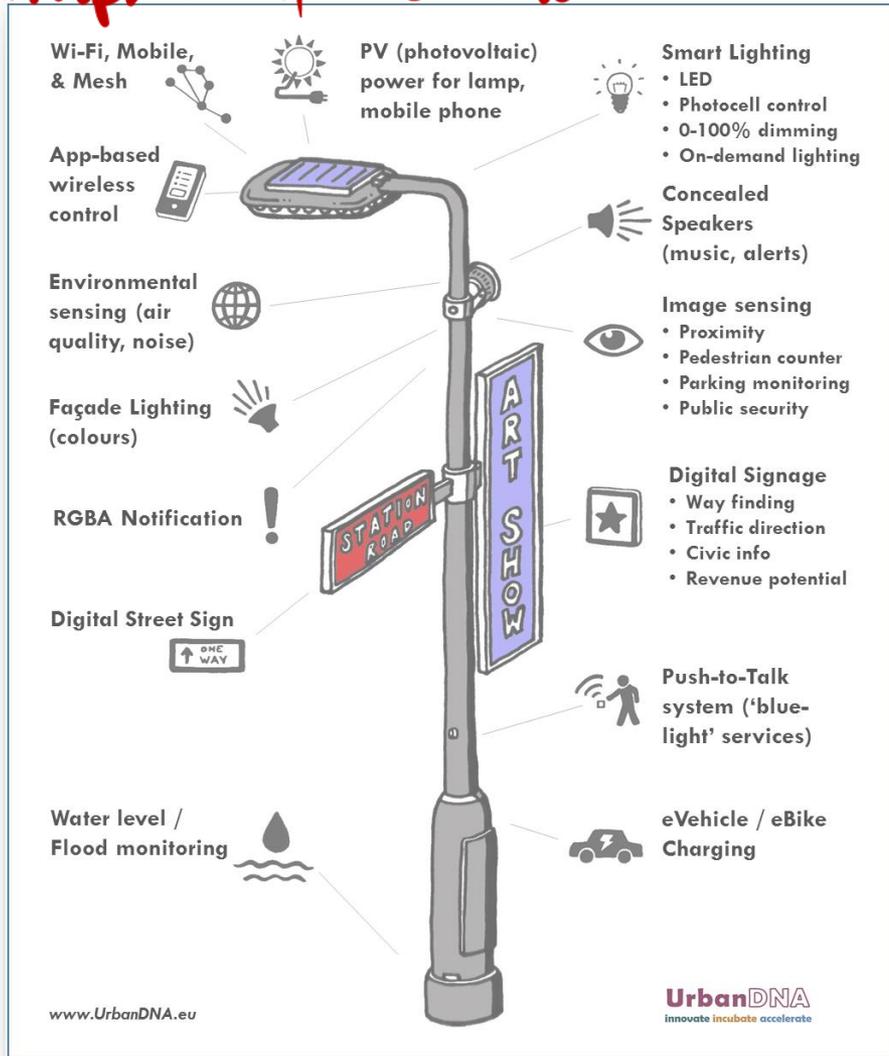
- "City-Needs-led" approach
- Capacity constraints

Not having something to show is the kiss-of-death

Keep it simple - & do it well!

EU STATS

- 60-90m Estimated nos. streetlights across Europe
- 75% Percentage of streetlights over 25yrs old
- 20-50% Proportion of city's energy bill from streetlights
- €3 bln Approx. annual street lighting energy cost
- 50-75% Energy saving potential thru LED
- €1.9 bln Annual energy saving from LED
- 2.6 mln GHG equivalent in removing #cars from EU roads

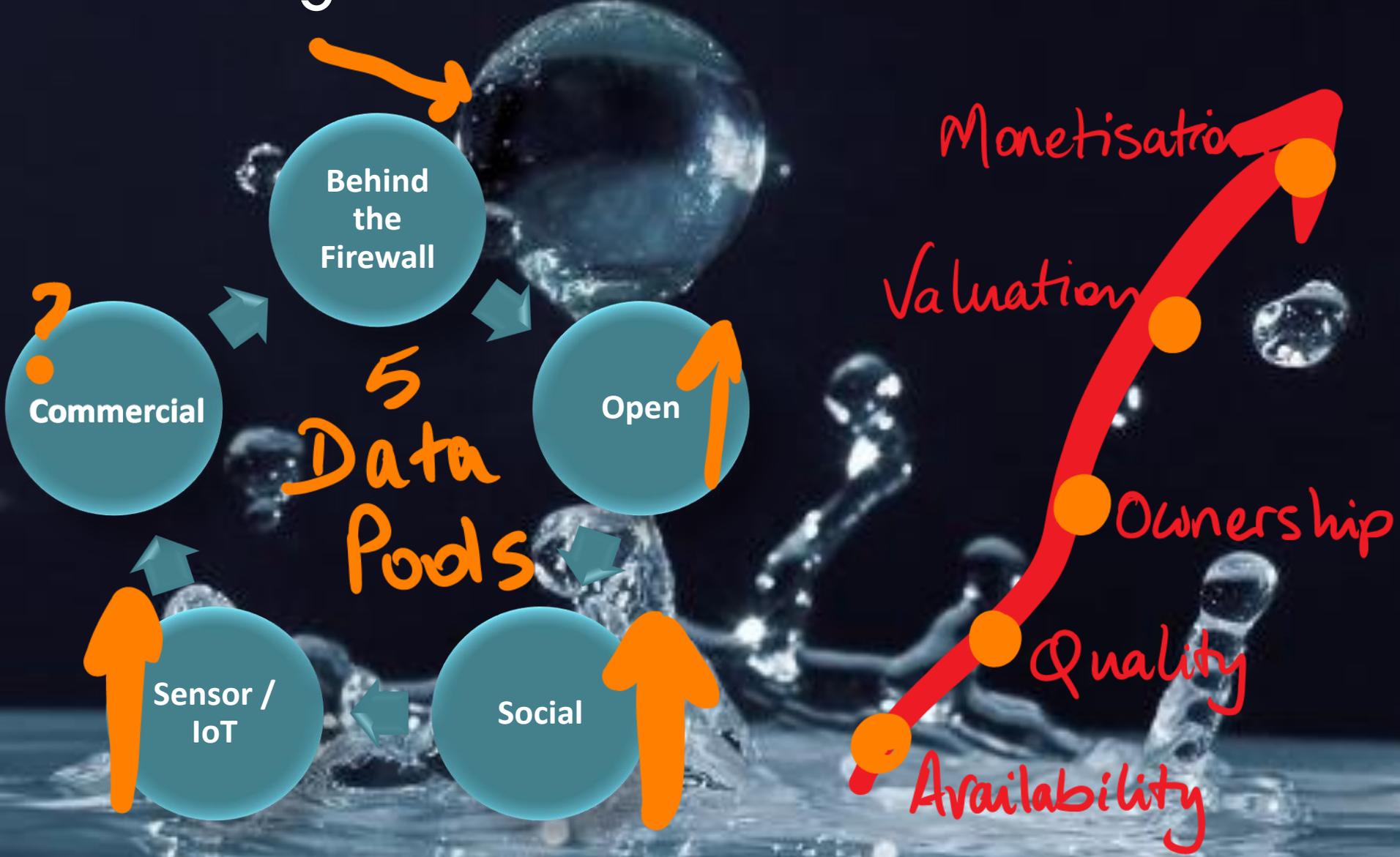


Demand Aggregation in action!

GOAL
 10 Million Smart Lampposts across EU Cities

VISION
'Bootstrap the Smart City'
An open affordable component-based city lighting solution
... that enables other smart city initiatives;
delivered collaboratively between cities & Industry
to speed integrated valuable delivery

Don't forget the data!



Barriers to data sharing are often 'perceived' not real

7 Learnings

- 
- A city skyline at sunset, with skyscrapers silhouetted against a vibrant orange and pink sky. Light trails from traffic are visible in the foreground.
- #1: Don't apologise for complexity — develop **systemic integrated** understanding
 - #2: **Aggregate demand** around common solutions — notably for smaller cities
 - #3: Develop pan-city representative **leadership** that sustains beyond political cycles
 - #4: **No more pilots !**
 - #5: Close the serious **gaps** in the market (notably with financiers)
 - #6: Deliver something **real and visible** (soon) to build confidence
 - #7: Develop a far more informed view on **data**



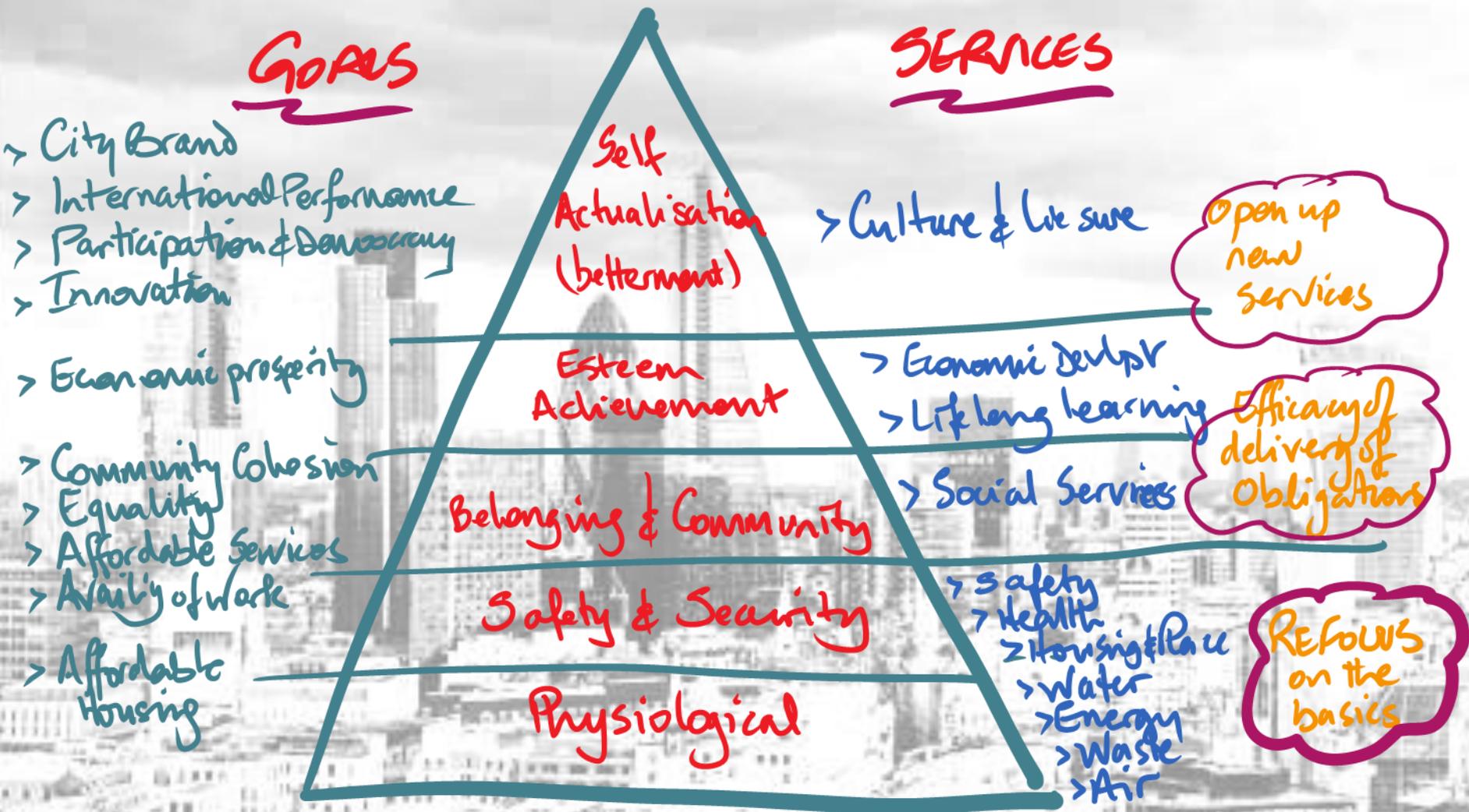
There's actually another learning...
Change is hard!



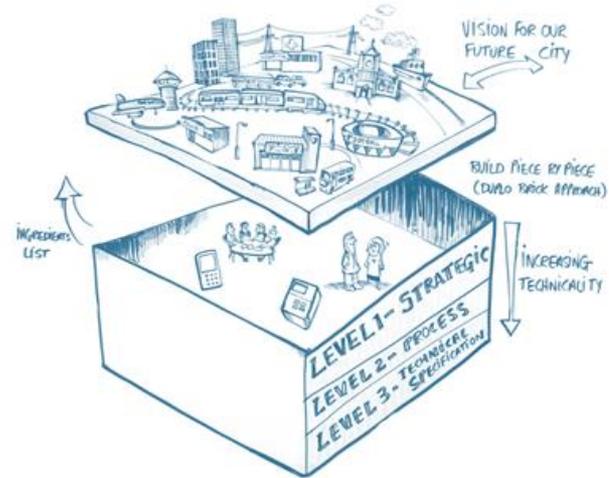
- Context
- “Wave 1” Smart City Learning
- **Opportunities for the future**



It's time to revisit basic Maslowian principles



Active support to develop a portfolio of Guidance & Standards



AENOR CTN 178: Team work

- SC 1, Infrastructures**
 - GI 1, Public Service Networks
 - GI 2, Deployment of ICT Infrastructures
 - GI 3, Convergence of the Management Control Systems
 - GI 4, Platforms Interoperability for Smart Cities
 - GI 5, Universal accessibility, urban planning and territory distribution
- SC 2, Indicators and Semantics**
 - GI 1, Definition
 - GI 2, Indicators
 - GI 3, Indicators of Citizens Rights
- SC 3, Government and mobility**
 - GI 1, Governance
 - GI 2, Mobility
 - GI 1.1, Open Data
 - GI 1.2, City Asset management
 - GI 2.1, Infrastructure for smart road of electric vehicles
 - GI 2.2, City for characterization, use and improvement of urban and rural territories
 - GI 3, Smart management of rural territories
 - GI 2.3, Accessible mobility
- SC 4, Smart tourist destinations**
 - GI 1, Innovation
 - GI 2, Technology
 - GI 3, Accessibility
 - GI 4, Governance
- SC 6, Public Services 4.0**
 - GI 1, Innovation
 - GI 2, Technology
 - GI 3, Accessibility
 - GI 4, Governance

smartcity red.es

AEN/CTN 178 Smart cities

AENOR GOBIERNO DE ESPAÑA MINISTERIO DE INDUSTRIA, ENERGÍA Y TURISMO SECRETARÍA DE ESTADO DE TRANSFORMACIÓN DIGITAL PARA LA GOBERNACIÓN DE LA INFORMACIÓN

SECRETARÍA DE ESTADO DE TURISMO **SEGITTUR** Turismo e Innovación

Over 700 experts from industry (big, SMEs), public administrations (local & central government), service providers, professional associations, clusters, etc.

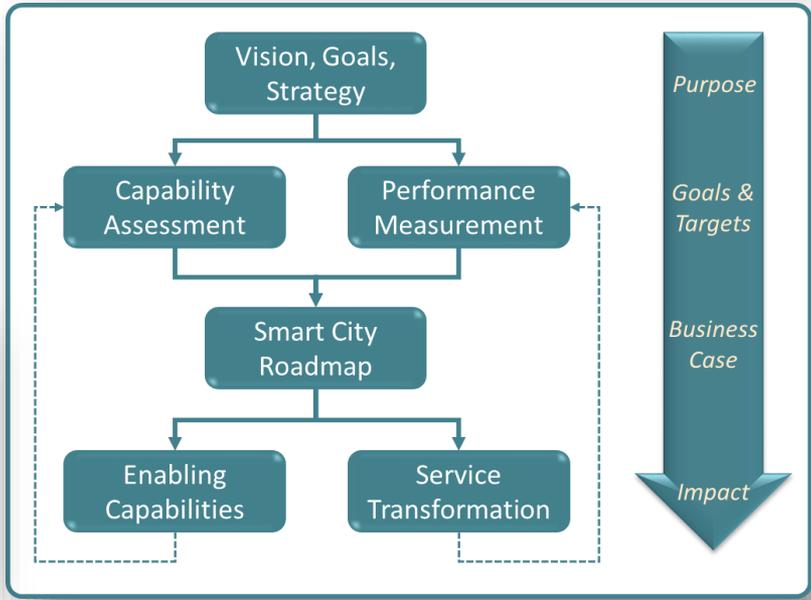
ISO

ISO TMB Smart Cities Strategic Advisory Group Final Report 2015

"responding to complex forces shaping urban life in the 21st century"

SDOs & products are not sufficiently relevant to senior city stakeholders

Response	Count
Strongly Disagree	2
Disagree	1
Neutral	3
Agree	13
Strongly Agree	16



Making cities smarter
Guide for city leaders: Summary of PD 8100

bsi. ...making excellence a habit™

UK plc First and Best
A Programme to Shape the UK Smart Cities Market

Dispositivo para la Innovación



5 things a City Mayor should have a reason **not** to be doing

#1: The Humble Lamppost

#2: Smart Parking

#3: Smart Waste

#4: Health & Wellbeing

#5: Transparency

EU Innovation Partnerships – a pan-EU movement

...an opportunity to change the market



European Innovation Partnership for
Smart Cities & Communities (EIP-SCC)

<https://eu-smartcities.eu/>



- 20/20/20 Strategic Goals. Refreshed Urban Agenda. €15 bln assigned funds
- A strategic instrument for Europe to mobilise Industry, Cities, Governments, Investors, Academia and other partners
- 6 Key words: **Accelerate**, **Scale**, **Impact**, **Integrated** (approach), **Common** (solutions), **Collaboration**
- 377 commitments from 4,000 organisations across Europe
- ~10 key multi-actor initiatives in motion across 6 Action Clusters (themes)

A few EIP-SCC examples ...

6-Nations Smart City Forum *Aligning cities to national level*

Theme	Level 1 Nascent	Level 2 Emerging	Level 3 Coordinated	Level 4 Programmatic
Policy / Strategy / Plans	<ul style="list-style-type: none"> Limited urban policies in place No smart city policy or strategy in place No national smart city plans or goals No specifically assigned resource 	<ul style="list-style-type: none"> Deep level urban smart city planning Theoretical agreed urban policies Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities
Governance / Organisation	<ul style="list-style-type: none"> No real understanding of smart city No governance mechanisms in place Clear misalignment between Dept. & City No formal resource in place Clear risks remain unmanaged 	<ul style="list-style-type: none"> Informal political support for smart city Clear alignment between Dept. & City Some formal resource in place Clear risks remain unmanaged 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities
Programmes / Funds	<ul style="list-style-type: none"> Little targeted funds for smart cities at city level Activities occasionally & tactically led Issue resolution based department action on smart city matters Disengaged investment community 	<ul style="list-style-type: none"> Smart city market activity Gov funded Some targeted funds for smart cities at city level Issue resolution based department action on smart city matters Disengaged investment community 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities
Market Engagement	<ul style="list-style-type: none"> Any smart city activity in industry led Not really driven from international Limited local smart city industry activities, not supported strategically Cities not engaged / exposed to smart city opportunities 	<ul style="list-style-type: none"> Smart cities seen as essential Local smart city industry activities, not supported strategically Cities not engaged / exposed to smart city opportunities 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities
Enabling	<ul style="list-style-type: none"> No real national level guidance on smart cities, any standards used by industry in absence of city knowledge Limited / no research to support smart city market National market only focus 	<ul style="list-style-type: none"> Smart city market activity Gov funded Some targeted funds for smart cities at city level Issue resolution based department action on smart city matters Disengaged investment community 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities
Monitoring	<ul style="list-style-type: none"> No coherence of measurement to align smart cities to priority outcomes No common or adequately reported smart city metrics No real culture of performance and recognition of smart potential 	<ul style="list-style-type: none"> Smart city market activity Gov funded Some targeted funds for smart cities at city level Issue resolution based department action on smart city matters Disengaged investment community 	<ul style="list-style-type: none"> Clear policy proposals for smart cities Formally agreed urban policies for smart cities Some national smart city policies Some national smart city plans or goals Some specific assigned resource 	<ul style="list-style-type: none"> Evidence based policies well established for smart cities Clear effective international strategy for smart cities & communities Aligned programmes of activities

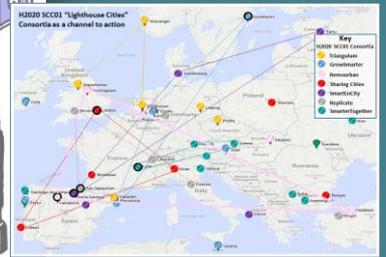


Integrated Infrastructure Action Cluster

Urban Platform *A basic foundation to exploit city data*



Humble Lamppost *Demand aggregation to capture advantages of scale*





EU collaboration in support of Urban Resilience

"Shift Left"



Built on proven methods that provide a systemic approach to transform urban resilience



Name	Description	Subsystem	Severity	Cost Rating	Impact	Consequence
Pressure Build Up	Pressure build up	Water	High	Medium	1	Failure of pressure build up valve
Cooling water leak	Leaking water	Water	Medium	Low	2	Failure of cooling water valve to leak
Cooling water leak	Leak flow of cooling water	Water	Medium	Low	1	Pipe leakage
Cooling water leak	Leak flow of cooling water	Water	Low	2	Pipe leakage	
Cooling water leak	Leak flow of cooling water	Water	Low	1	Failure of cooling water valve to leak	
Heat Exchanger leak	Leaking water	Water	Critical	High	1	Failure of cooling water valve to leak
Heat Exchanger leak	Leaking water	Water	High	Medium	1	Leakage of oil and cooling water
Heat Exchanger leak	Leaking water	Water	Medium	Low	1	Leakage of cooling water



Use the €200mln H2020 Lighthouse funds strategically



Synergies

It's your choice to act – for your kids & kids' kids



Many thanks!