SMART 2020

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This is part of
THE CLEAN REVOLUTION

SMART 2020 for Cities

Saving15% of global emissions in 2020

The Smart City Challenge

The application of new 'smart solutions' helps complex systems become more efficient – raising connectivity, increasing feedback and providing powerful new decision-making tools. Cities have the most to gain: they are dependent upon infrastructure that is of high complexity and is facing increasing pressures, and they are responsible for over 70% of emissions through transportation, buildings and other city services. It is therefore critical that city leaders understand the opportunities available.

City and state governments are necessary catalysts for innovation in the clean, smart revolution. But they are currently unable to fulfill this role:

— Cities cannot strategically plan for ICT in their cities because they cannot **calculate the co-benefits of ICT enabled solutions** measured as cost savings, economic development, job creation, environmental benefits or quality of life.

— Cities are not incentivized to be first adopters of **new intelligent solutions** that cut costs and benefit citizens and the environment, and are therefore slow to bring these benefits to citizens

— SMART controls make existing solutions more impactful and attractive, but cities are unaware of the **additional benefits of a smart control system**

— Cities are unaware of intelligent solutions that have been tried elsewhere and **they are reinventing the wheel**

— Cities either do not have the skills to adopt - or are unconvinced about the benefit of - **integrated solutions**, for instance operations centers, decision-making dashboards.

— Cities could be **providing more access to data and supporting the private sector** to unleash innovation.
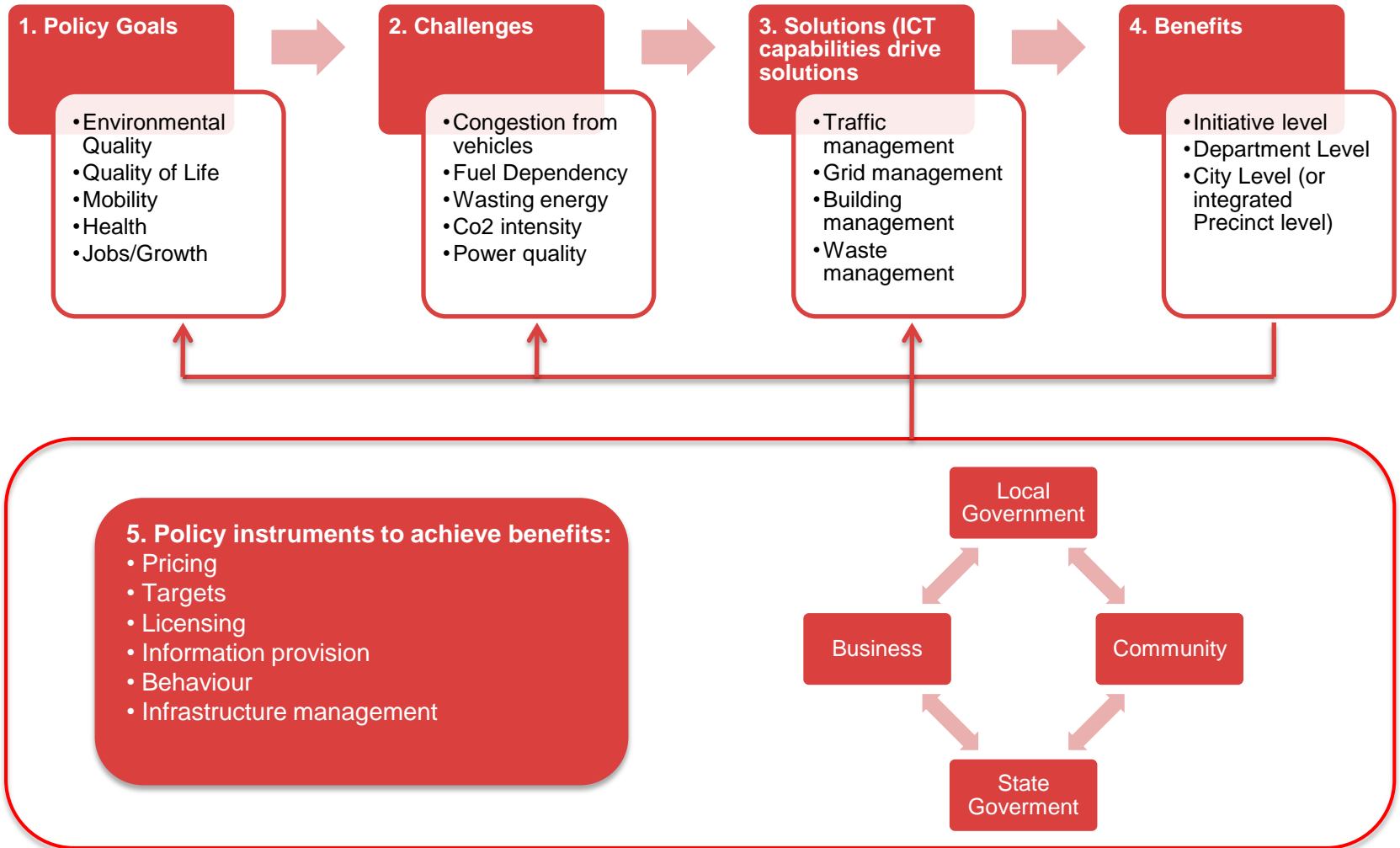
Identifying the Opportunity for Cities - Report

— What is the definition of a 'smart' city?

— How do we ensure that 'smart' connected cities are delivering sustainability benefits?

— What is the standard framework for what makes a city 'smart' that allows lessons to be transferrable?

As a result of the SMART 2020 for Cities report, cities will:

— Understand the value of a smart city to their challenges

— Understand the pathways to becoming smart, and the 'diffusion curves' of the solutions they adopt

— Understand the approach for calculating value at each stage of the curve (initiative level, departmental level, cross-department or city level)

— Have access to an approach for how to prioritize projects and actions

SMART Value case approach

1. Policy Goals
- Environmental Quality
- Quality of Life
- Mobility
- Health
- Jobs/Growth

2. Challenges
- Congestion from vehicles
- Fuel Dependency
- Wasting energy
- Co2 intensity
- Power quality

3. Solutions (ICT capabilities drive solutions
- Traffic management
- Grid management
- Building management
- Waste management

4. Benefits
- Initiative level
- Department Level
- City Level (or integrated Precinct level)

5. Policy instruments to achieve benefits:
- Pricing
- Targets
- Licensing
- Information provision
- Behaviour
- Infrastructure management

Local Government

Business

Community

State Goverment

— Goals broadly fall into the same categories in each city (environment, growth etc)

— Each city will frame goals differently, for instance

    — Save energy, cut costs for citizens

    — 100% renewables

    — Zero energy homes

    — Increase mobility

— Each city will have different mayoral powers, for instance

    — Control of building stock

    — Control of transportation infrastructure

2. Challenges

Energy

— Distribution losses are high

— Congestion is high

— Reliability is low

— Decentralised power is increasing quickly

— Electric vehicle sales are increasing

— Peak power is increasing rapidly (appliance sales are rising, hotter summers, etc)

— Electricity prices are rising

— Homes are wasting energy unnecessarily

— Buildings are wasting energy from lack of integrated systems

Transport

— High emissions from travel

— Lots of accidents

— High congestion

— Low utilisation of public transport

— Low density

— Few options / alternatives for public transport

— Low use of cycling infrastructure

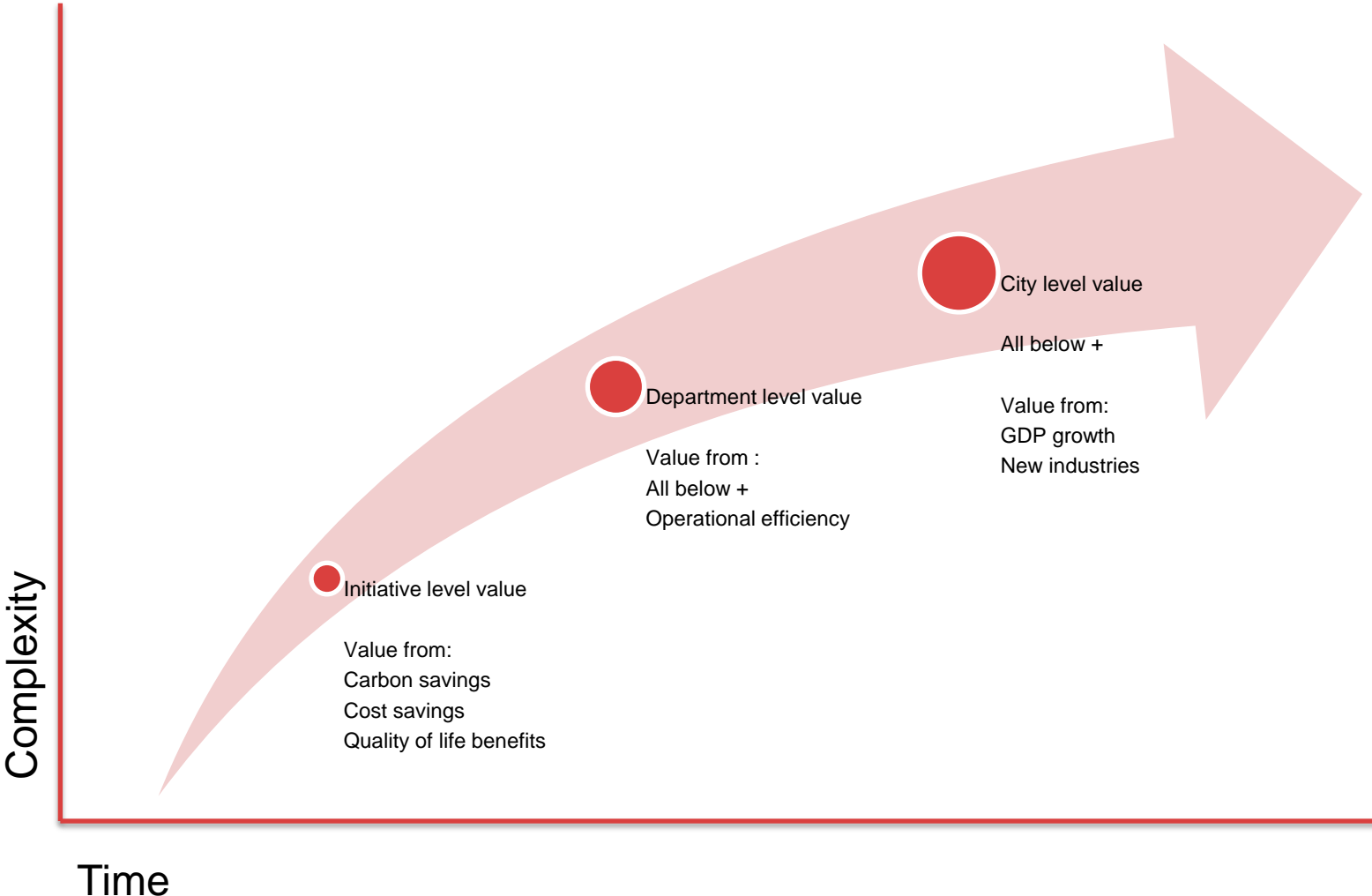— Number of people per car is 1

— Long commute time (congestion)

3. Solutions - Examples

— Monitoring and managing the "footprint" of services or cities/regions to enable better decision making and planning

— Modal shift through connected mobility and/or logistics solutions

— Increasing renewable power through distributed, decentralized and community energy solutions through smart/micro grids

— 15-30% more efficient buildings through energy information at building level and optimization of systems in the building

— Information on water and waste management to enable optimization of use of resources

— Lighting emissions reduced through smart and adaptive outdoor lighting solutions

— New business models, options and services, such as enabling electric vehicle charging or smart work centers to change working patterns

3. Solutions - ICT Capabilities that drive solutions

— Improve the modeling that helps build infrastructure more efficiently in the first place

— Setting performance targets early and tracking progress to those

— Improve access to infrastructure

— Avoid the need to build infrastructure

— Fill up excess capacity in existing grid, vehicles, or buildings

— Make infrastructure use more efficient

    — monitoring and control

    — adapting and learning

    — self-healing

    — Real-time feedback

    — Automation

4. Benefits at 3 levels - Diffusion curve of smart cities

Complexity (y-axis)

Time (x-axis)

Initiative level value

Value from:
Carbon savings
Cost savings
Quality of life benefits

Department level value

Value from :
All below +
Operational efficiency

City level value

All below +

Value from:
GDP growth
New industries

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4. Drivers of Value

— Cost

    — Defer build (for power providers? Or neighborhoods)

    — Increase reliability (fewer outages)

    — Save money on fuel / electricity consumption

    — Reward efficiency (in buildings, homes, etc)

    — Increase supply of renewables (for buildings or neighborhoods)

    — Time saved (opportunity cost)

    — Reduction in cost of building build/maintenance

— Economic growth

    — New jobs

    — GDP

— Operational efficiency

— Quality of Life

5. Policies (Groupings and Examples)

— Pricing
  — Feed in Tariffs
  — Energy Efficiency incentives
  — Rebates

— Attitudinal and behavioural measures
  — Car clubs

— Information provision
  — Real time driver information systems
  — Signage

— Infrastructure management
  — Intelligent transportation systems
  — Bus or fleet management

5. Policies – Challenges to overcome

— **Regulatory Barriers:** Utilities business model based on making profits by selling more power. Relevant policy drivers come from multiple sectors

— **Informational Barriers:** Lack of awareness of benefits of open energy information among consumers, lack of awareness among 'customers' such as public officials about how to implement alternatives.

— **Lack of Cross Sector Implementation:** Solutions that can operate across domains are still not widely adopted

— **Financial Barriers:** Solutions will require sharing risk between public and private sectors, to capture 'diffuse' savings

— **Unclear Business Case:** Often long payback periods for energy efficiency investments, lack of incentives from developers and owners to invest in smart building technologies

— **Behaviour Change Still Unpredictable:** Behaviour change on a large scale is possible but the financial incentives are not there. Consumer engagement and developing demand is cited as the most challenging barrier to the smart grid.

Case studies

— Choose case studies at each level of the diffusion curve and assess value to demonstrate the approach

— Case studies of individual initiatives may include
  — Cycle hire schemes
  — Smart buildings

— Case studies of department or sectoral approach could include
  — Smart grid cities (energy focus)
  — Intelligent transportation systems (transport focus)

— Case studies at city level could include
  — Climate smart precincts
  — Operations centres
  — Open Datastores

Report Outreach and Impact

The report provides the basis for cities to define 'smart city' strategies, identify highest areas of value for the city, and identify specific initiatives to take the next step on the path to a smart city

Communicate

- Launch the report on 8-10 November at the Intelligent Cities conference, Hamburg
- Disseminate the report at the Metropolis Conference Nov 21-23
- COP in Durban
- Ongoing communications

City outcomes

- Cities use the report to create strategies and evaluate their own next actions
- Identify pilot projects or policy initiatives
- Develop a toolkit or assessment format for cities

Transformation

- Baseline measurement for cities
- Identify indicators to measure progress
- Engage with city, state or national governments to overcome barriers to scale up