

EVALUATING SUSTAINABILITY OF ICT SOLUTIONS IN CITIES

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EIGHTH ITU SYMPOSIUM ON ICTs,
THE ENVIRONMENT AND CLIMATE CHANGE



ICT AND SMART CITIES



Remote Patient
Monitoring

Connected Buses

Smart Education

Smart Meters

Fleet Control

Connected Cars

Connected Home

Smart Work

SMART CITIES = SUSTAINABLE CITIES?

WHY STUDY ENVIRONMENTAL IMPACTS OF ICT AT A CITY LEVEL?



“What is measured is valued”

Identify main impacts

Share best practices

CITIES AS SUSTAINABILITY DRIVERS

GHG IMPACT ASSESSMENTS RELATED TO CITIES



ICT GHG footprint of
city administrations

ICT GHG footprint of
Organizations and households

GHG emissions of
ICT projects

ICT sector

Non-ICT sector

GHG emissions of
ICT services

GHG emissions of
ICT projects

**Widening
scope
–
increasing
potential!**

ASSESSING ICT SOLUTIONS IN A CITY



Describe the
ICT solution



Select functional
unit and system
boundaries



Build a
usage
scenario



Calculate
impacts



IMPORTANT ASPECTS



Selection of indicators
(beyond CO₂e)

Transparency in
city boundary

Realistic scenario for
ICT and baseline scenarios

Transparency in
results

Life cycle thinking

Data access

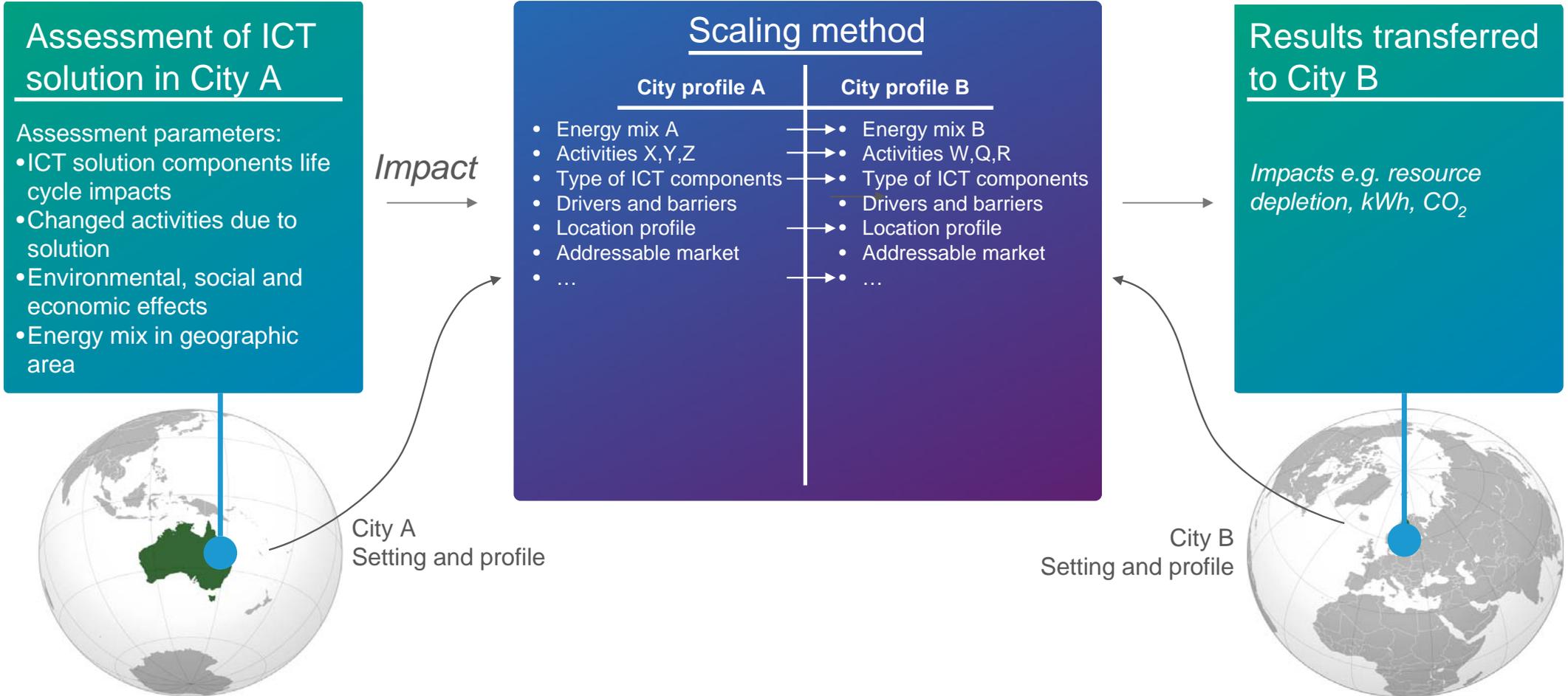
Large-scale effects
(rebound etc)

Transfer of results

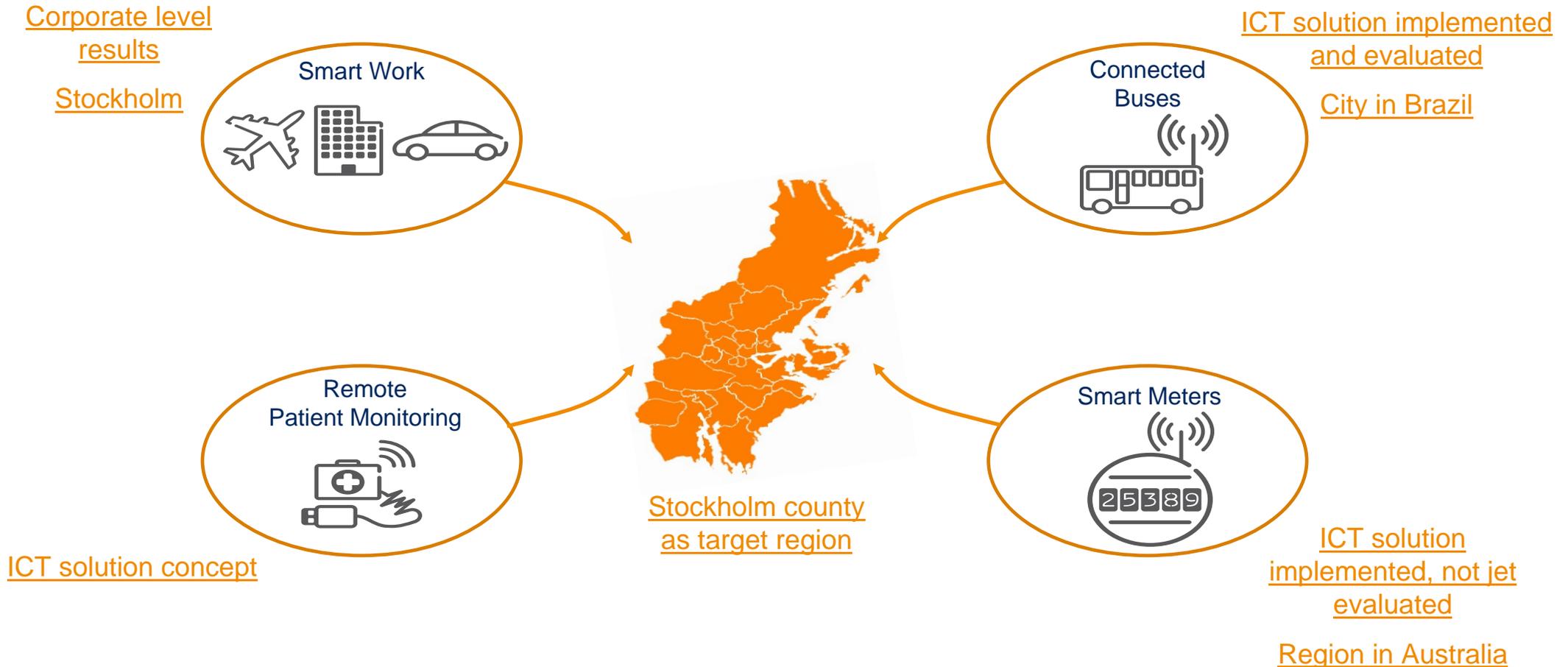
Assessment methodologies must allow for different kinds of assessments

SHARING BEST PRACTICES

- TRANSFERRING RESULTS BETWEEN CITIES



METHODOLOGY APPLICATION - TRANSFERRING RESULTS BETWEEN CITIES



FURTHER READING



Methodology:

Evaluating sustainability of using ICT solutions in smart cities – methodology requirements
(N. Lövehagen, A. Bondesson)

<http://e-collection.library.ethz.ch/eserv/eth:6558/eth-6558-01.pdf> p 181-188

Case studies:

Contact:



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SMART WORK AT TELIASONERA

As mobile broadband becomes universal, and more and more things and people become connected, the opportunities provided by ICT multiply. In Sweden, telecom operator Teliasonera has collaborated with Ericsson to study the impact of implementing ICT-based smart work solutions such as teleworking, flex working, virtual or telepresence conferencing and hot desks. The use of these solutions has significantly reduced the company's CO₂ emissions and travel costs.



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CONNECTED BUSES IN CURITIBA

Today, more people like to drive than to rent a car, and while cities continue the responsibility of our planet's resources, they are also looking for innovation. In Brazil, the city of Curitiba is transforming its public transportation system by connecting city buses to a high-speed mobile broadband network. This could mean a significant reduction of the city's energy consumption and total carbon dioxide equivalent (CO₂e) emissions.



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SMART METERING IN AUSTRALIA

Australia's largest energy distributors supply electricity to millions of customers in the major metropolitan areas and regional outback. The security network powers both large and small businesses, as well as major industries, including mining, shipping, tourism, manufacturing and agriculture.
With initiatives in smart grid development, the Australian Government is working closely with electricity companies to lead Australia as the forefront of energy networking.

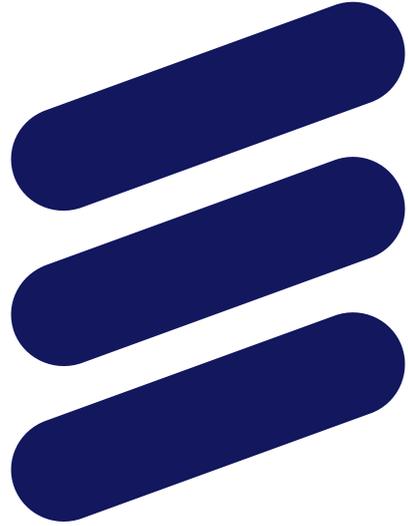
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SUMMARY



- › Environmental assessment of ICT impact at city level
 - Various assessment targets – different sustainability potential
 - Different cities – different setups
- › Important methodological aspects
 - Data access and transparency of boundaries and results
 - Life cycle perspective and realistic scenarios...don't forget the baseline!
 - Large-scale effects (rebound etc)
- › Cities as sustainability drivers
 - Importance of sharing best practices
 - Methodology for transfer of results needed



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CITY MODEL



Non-community services

Finance

Workplaces

Persuasive information

Community services

Healthcare

Education

Recreation & Commerce

Travel & Transport

Security & Safety

Living Environment

Infrastructure Services

Energy
Electricity

Water

Buildings

Transport
Infrastructure

Waste

Data- & Tele-
Communication

EXAMPLE OF SETTING SYSTEM BOUNDARIES – STOCKHOLM, SWEDEN



- › The Stockholm Municipality (to the left), the target geographical system boundary for assessments of impacts in Stockholm (middle), and geographical boundaries used in the assessment (to the right).



Stockholm
municipality



Target
definition



Stockholm
county
(selected geographical area)