

The energy and carbon footprint of the ICT and E&M sector in Sweden 1990-2015 and beyond

*Jens Malmudin, Ericsson Research
Dag Lundén, Telia Company*



Abstract

- › *“Decoupling” has stricken the ICT and E&M sector in Sweden!
Despite exponentially increasing data volumes and usage, CO2 emissions and energy consumption decreases (2010 – 2015)!*
- › *The trend of decreasing energy and carbon footprints is estimated to continue until 2020. Further on its not yet possible to estimate.*
- › *Sweden is among the leading ICT countries globally. It can be expected that development will follow a similar path in other ICT mature countries.
The last statement can be seen as verified in a new global ICT & E&M study (not yet published).*

The importance of knowledge

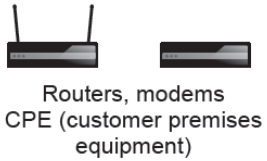
"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of science."

(William Thomson, Lord Kelvin, 1824-1927)

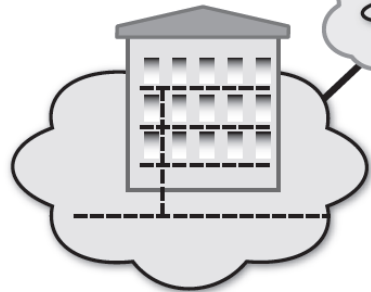
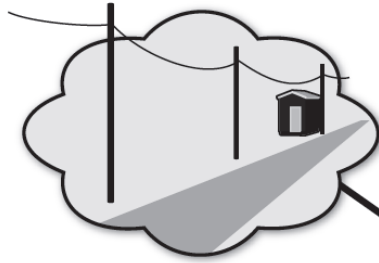
In short: What get's measured gets done"

Scope

User equipment



Access networks



ICT sector

Data transmission and IP core network

Operator activities

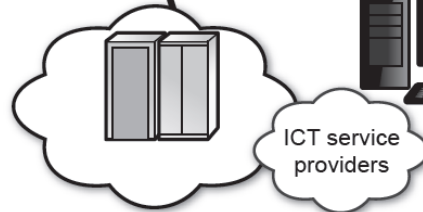
Including the operator's data centers



Global Internet

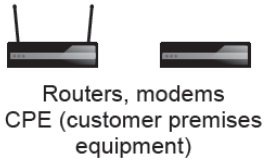


Enterprise networks and data centers

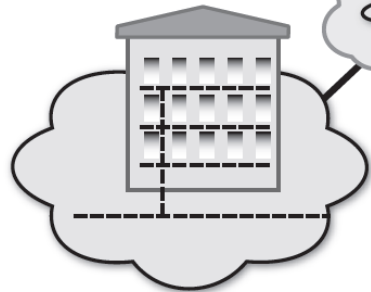
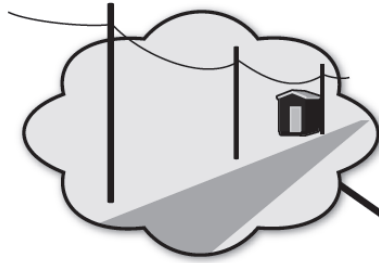


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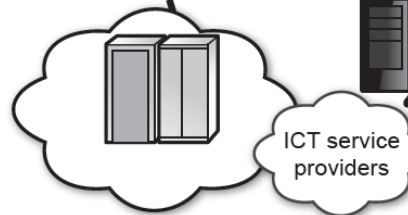
Data transmission and IP core network

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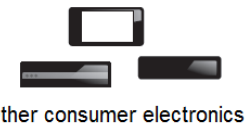
ICT service providers

Enterprise networks and data centers



User equipment
Business PCs
and office equipment

E&M sector



ICT services and E&M
content production

A typical Swede possess in average...



1 PC

(most PCs are laptops used in homes)



0,5 Tablet



...and have the highest data traffic in the world

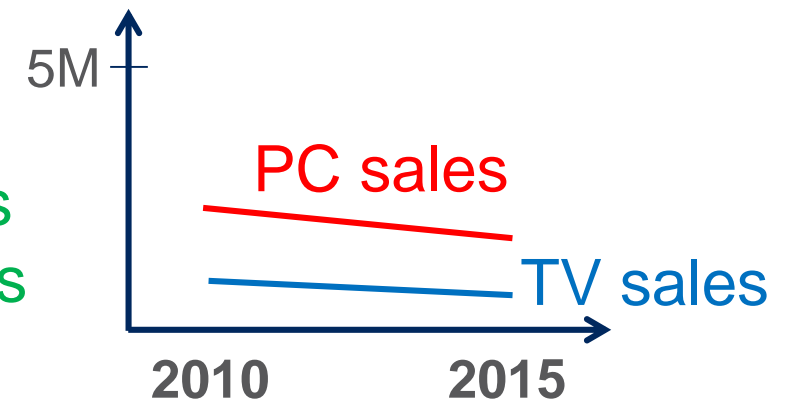
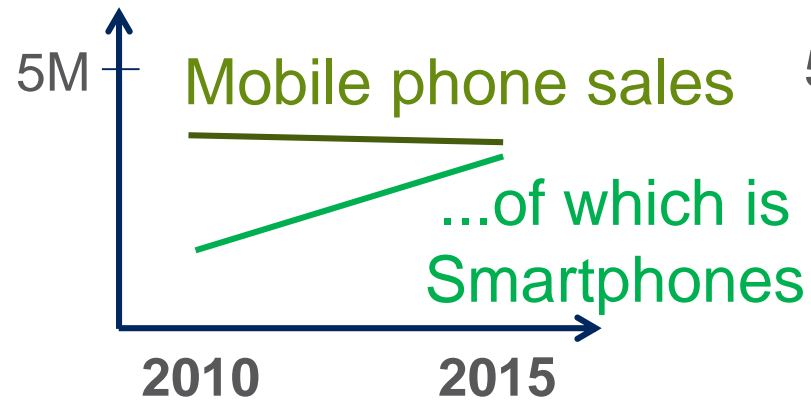
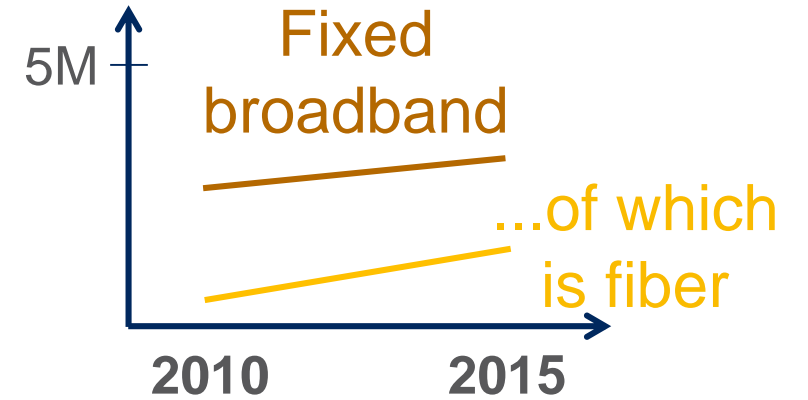
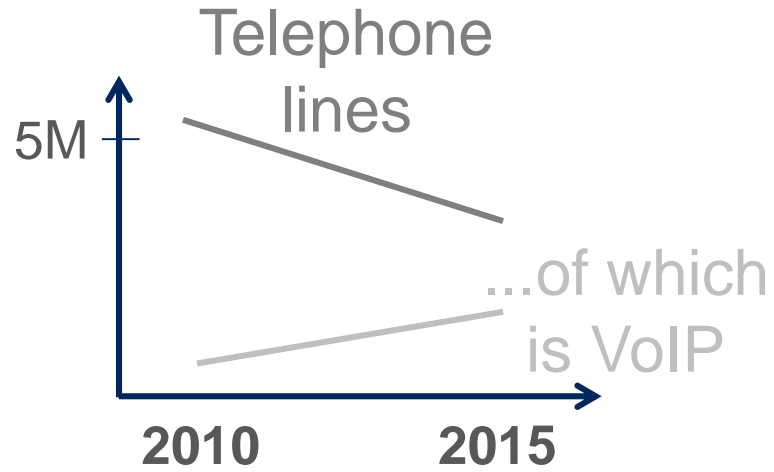
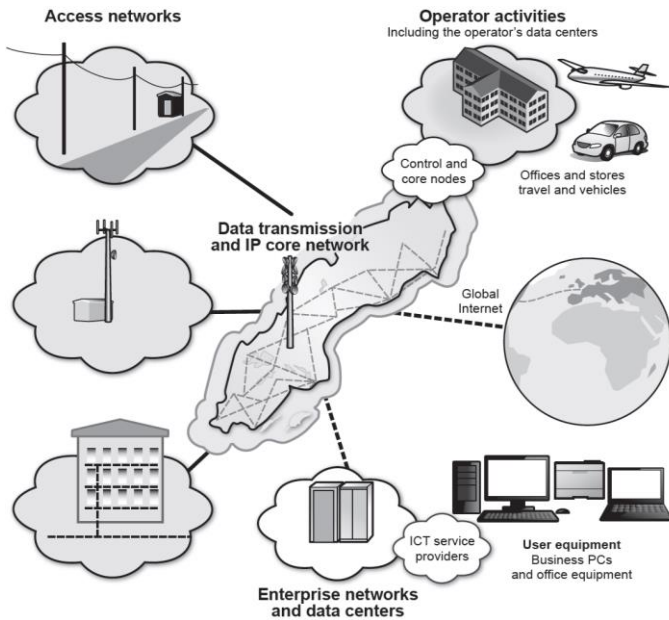


1.5 mobile phone
(mainly smartphones)



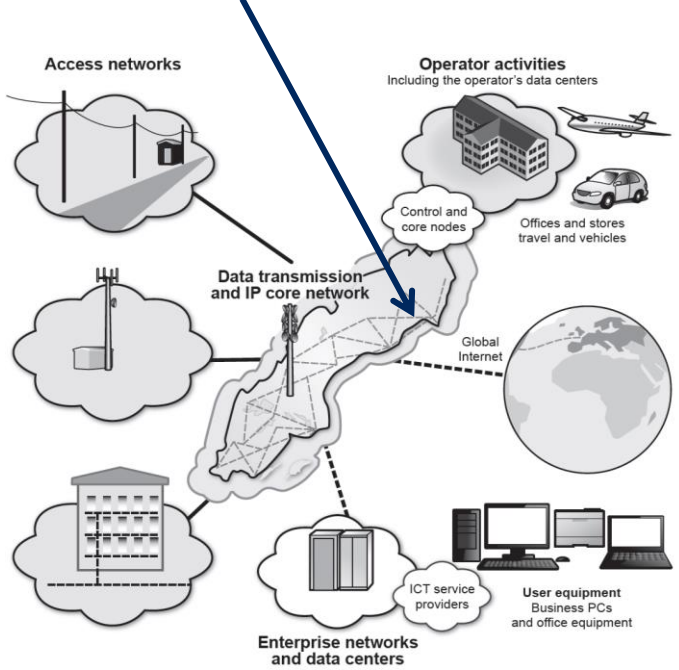
0.7 TVs

Swedish key data and trends

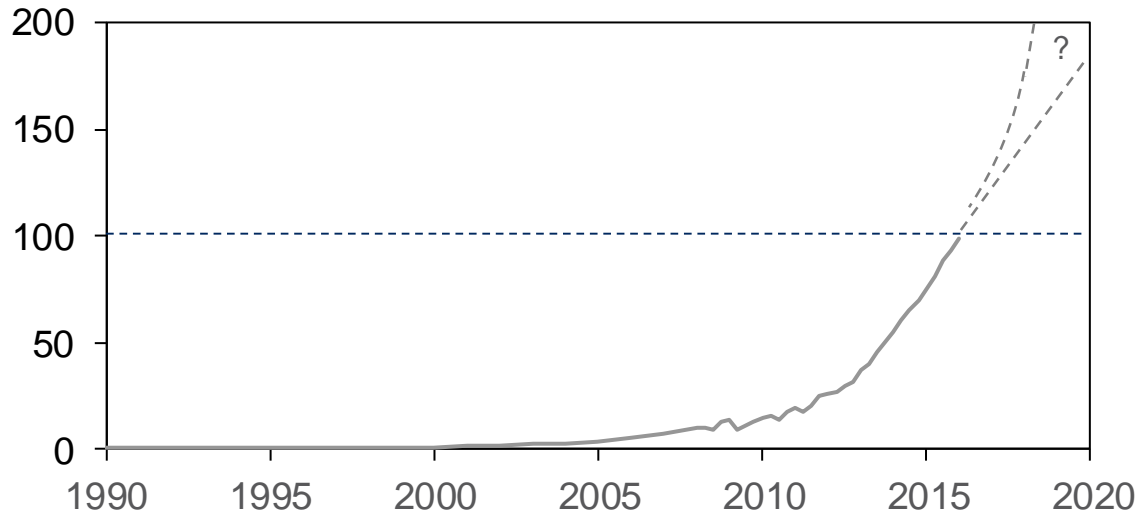


Swedish key data and trends

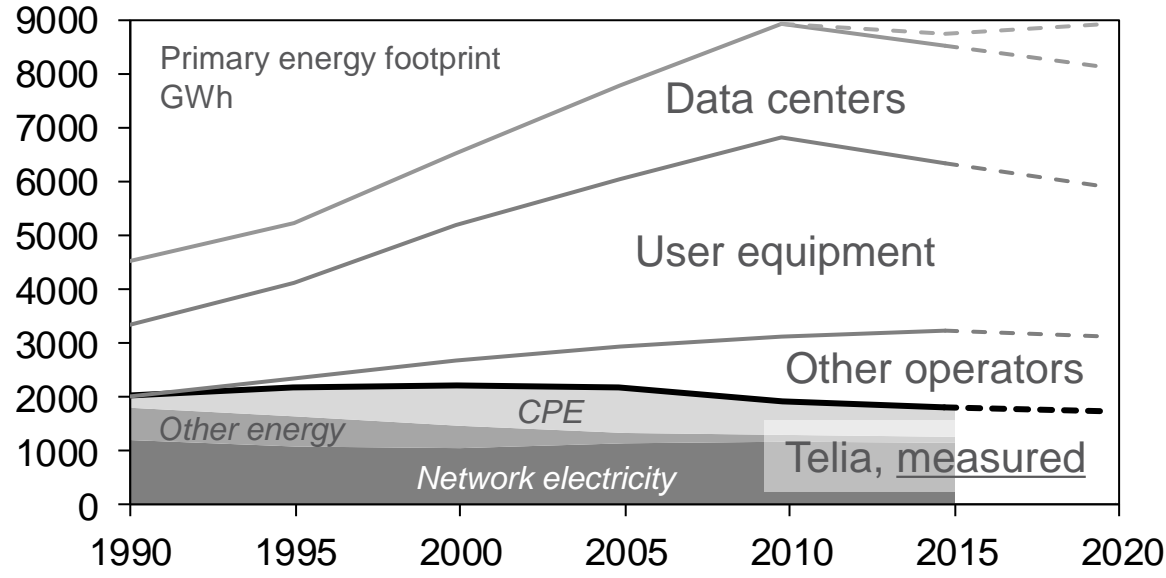
Facebook data center



Data traffic



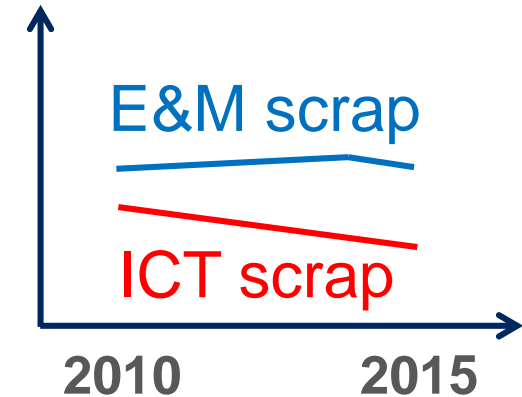
ICT sector use - energy consumption



Use behavior and trends



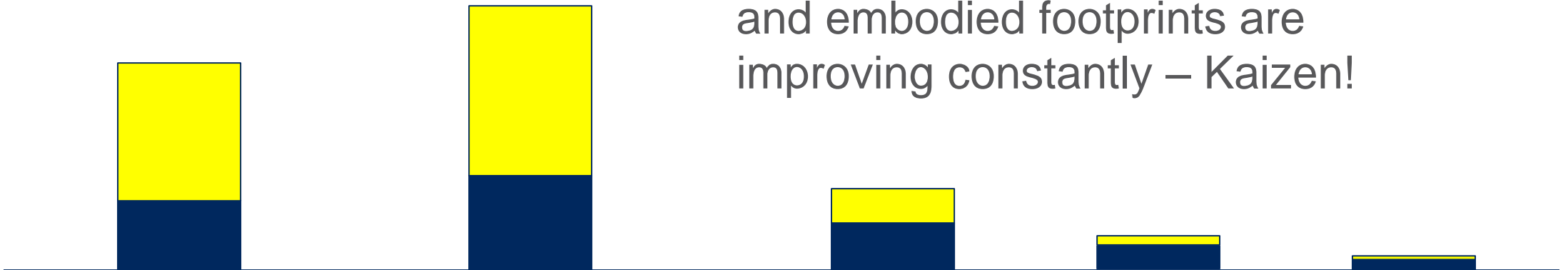
- › Usage “moves” to smaller and more energy efficient devices/platforms
 - from desktop PCs to laptop PCs
 - from TVs and PCs to tablets and smartphones
- › The PSTN or “POTS (Plain Old Telephony System)”
 - Are being decommissioned but more energy can be saved
- › Amount of ICT and E&M scrap is now decreasing
(Sweden has the highest recycling rate of electronics)



Life cycle impact, based on LCA



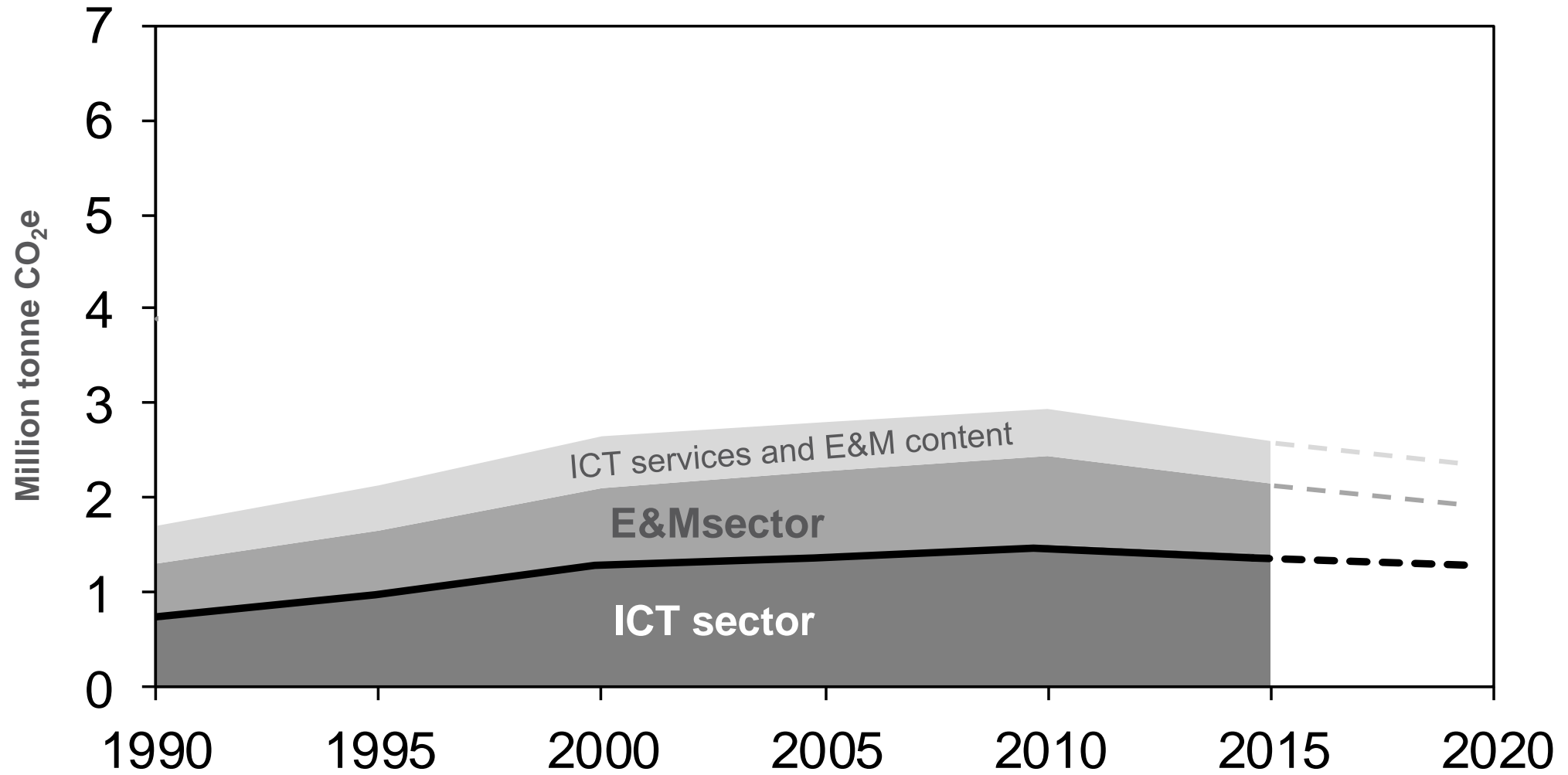
› Devices/platforms energy consumption and embodied footprints are improving constantly – Kaizen!



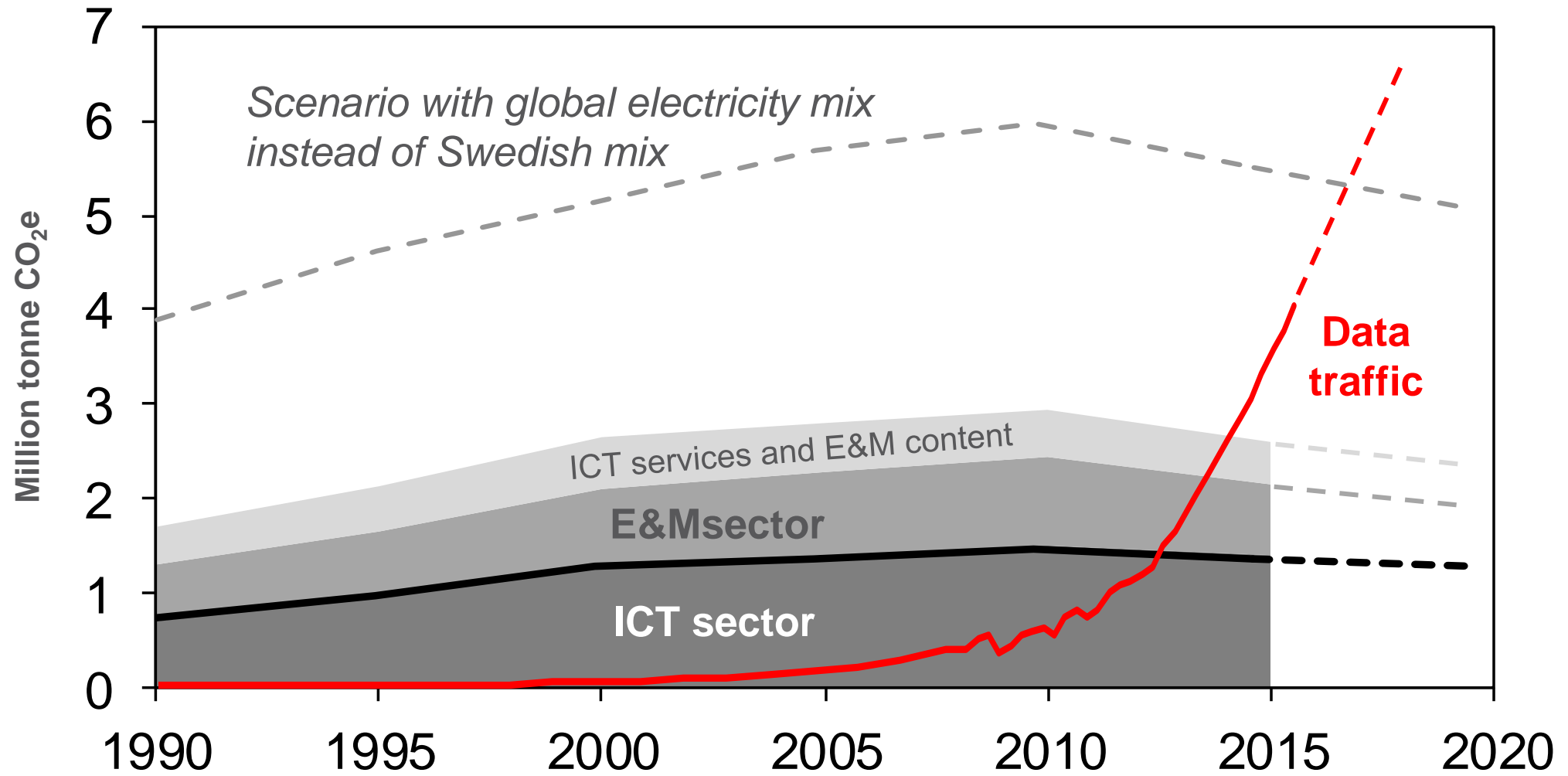
 Embodied carbon footprint

 Energy consumption

Results: Total carbon footprint - Sweden



Results: Total carbon footprint - Sweden



The new research scope – the globe!



***The global perspective:
A new global ICT and E&M study***
(Not yet published)

***Global ICT sector trends:
Electricity consumption vs data traffic***
(Not yet published)

Summary

- › *“Decoupling” has stricken the ICT and E&M sector in Sweden!
We see an exponentially increasing data volume and usage, still a CO2 emission and energy consumption decreases (2010 – 2015)!*
- › *The trend of decreasing energy and carbon footprints is estimated to continue until 2020. Further on its not possible to estimate. The added footprints from IoT is estimated to be rather small in the near by future.*
- › *Sweden is among the leading ICT countries globally. It can be expected that development will follow a similar path in other ICT mature countries.
The last statement can be seen as verified with the new global ICT & E&M study (not yet published).*

Thank you!



jens.malmodin@ericsson.com
Dag.Lunden@teliacompany.com