EcoBalance 2016, Kyoto, Japan

Environmental burdens of data centres – not only the use stage matters

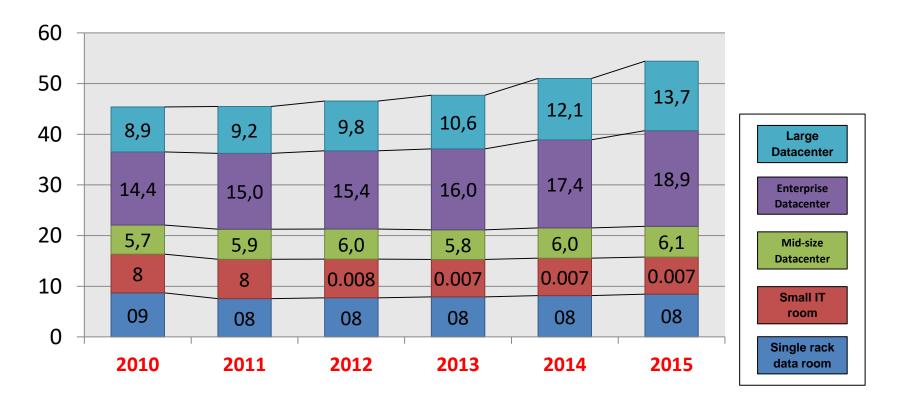
Kirana (Chomkhamsri) Wolf and Marc-Andree Wolf

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Data centres have become major contributors to the global rise in energy consumption and emissions

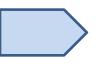
- About 2% of overall electricity consumption
- Rising faster than any other industry (while recently some temporary? – slowdown)
- IT equipment accounts for only about half of the total consumed use phase power
- But what about hardware, M&E and building production?

Introduction- Data Centre Challenges

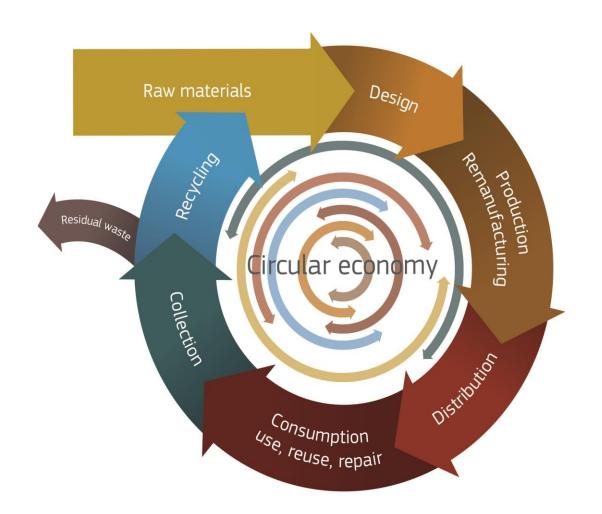


Despite higher growth in the large DC space, Small-to-Midsize data centers will continue to represent 40% of the installed base

Source: Gartner "Forecast: Data Centers, Worldwide, 2010-2015", October 2011

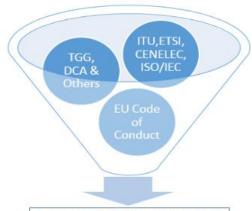


... to a circular economy





The concept



Framework of "Harmonised" BEST PRACTICES, KPI's and benchmarks

EURECA easy to use tool

- SIMPLE QUESTIONAIRE TYPE FORMAT
- CAN BE USED BY THE NON-EXPERT
- LIFE-CYCLE BACK GROUND INDICATORS
- QUESTIONS AIMED AT UNDERSTANDING:
 - O BASIC FORMAT OF DATA CENTRE
 - O WHAT BEST PRACTICES ARE DEPLOYED
 - O RESOURCE KPI DATA

PROJECT time line: 30 months

Total Budget: €1.5 Million

Goal: "Greener" Public Sector Data Centres

Project beneficiaries:

University of East London, Data Centre Alliance, Green IT Amsterdam, Cerios Green, Maki Consulting, Norland, Carbon3IT and Telecity Group GmbH

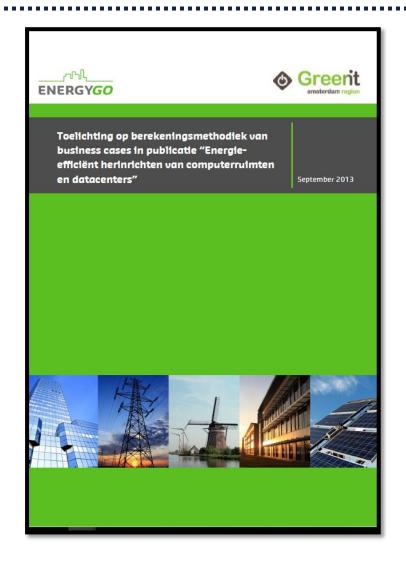
EURECA Self-Assessment Tool Outputs

EURECA WILL PROVIDE:

- A LIFE-CYLE SELF-ASSESSMENT "GREEN" SCORE
- MATURITY MODEL POSITIONING
- A SUMMARY OF THE PRIORITY AREAS TO ADDRESS
- SELF IMPROVEMENT ROADMAP
- STANDARDS SIGNPOSTING
- "GREEN" PROCUREMENT GUIDELINES
- COST BENEFIT/RFI ASSESSMENT TOOLS
- MARKET NAVIGATION ADVICE
- ROI & BUSINESS CASE INFORMATION



Business case - DC specification and assumption

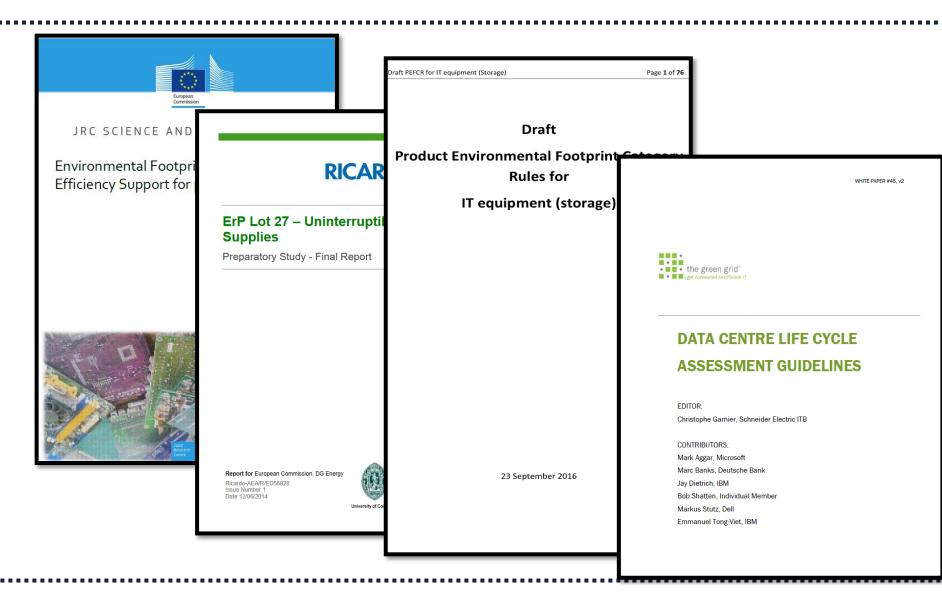


- 160 server racks, 500 m2 floor space, packed with 2U servers, virtualisation
- ICT capacity ca. 6kVA per rack
- Total ICT energy consumption is approximately 1 MW
- Hot and cold aisles in combination with in-row coolers
- Compressors are only required 20 % of the time
- UPS modular unit with 90% efficiency at the given partial load
- PUE* of 1.42

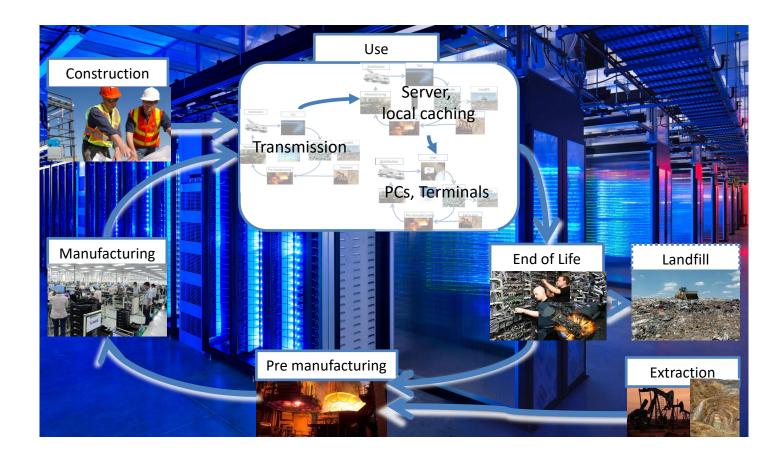
*
$$PUE = \frac{Total\ Facility\ Power}{IT\ Equipment\ Power}$$



Data sources – selected examples

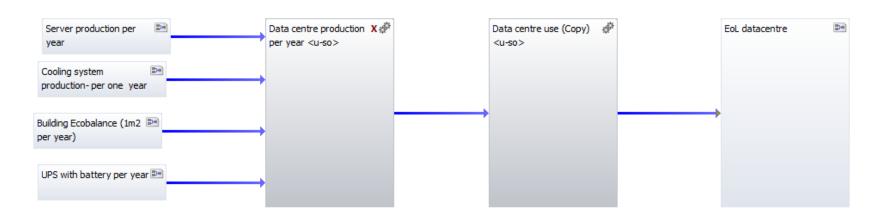


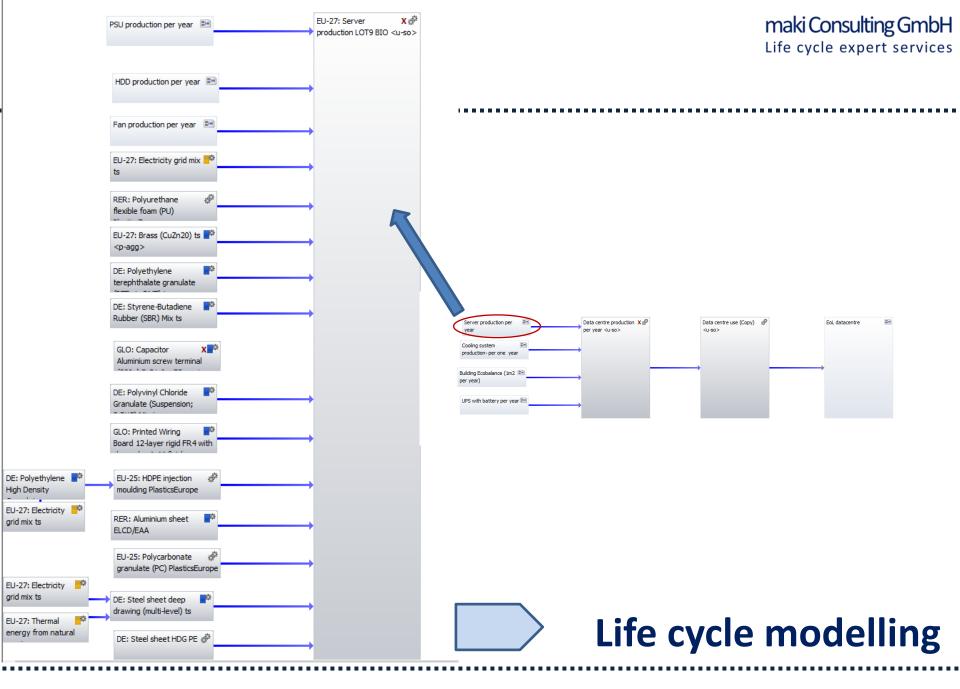
System boundary



Life cycle modelling

- GaBi software
- Secondary data used in modelling
 - GaBi database is used for electronic parts e.g. PCB, cable
 - Data from industries (associations) with GLO or EU27 for materials etc., consistent with GaBi data
 - Data available in ELCD for electricity, transport (original GaBi data)

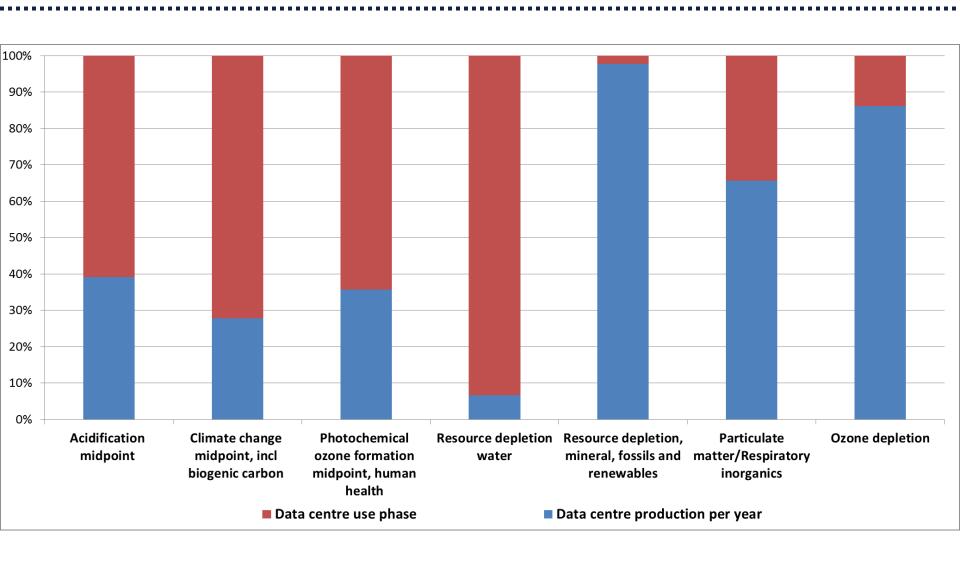




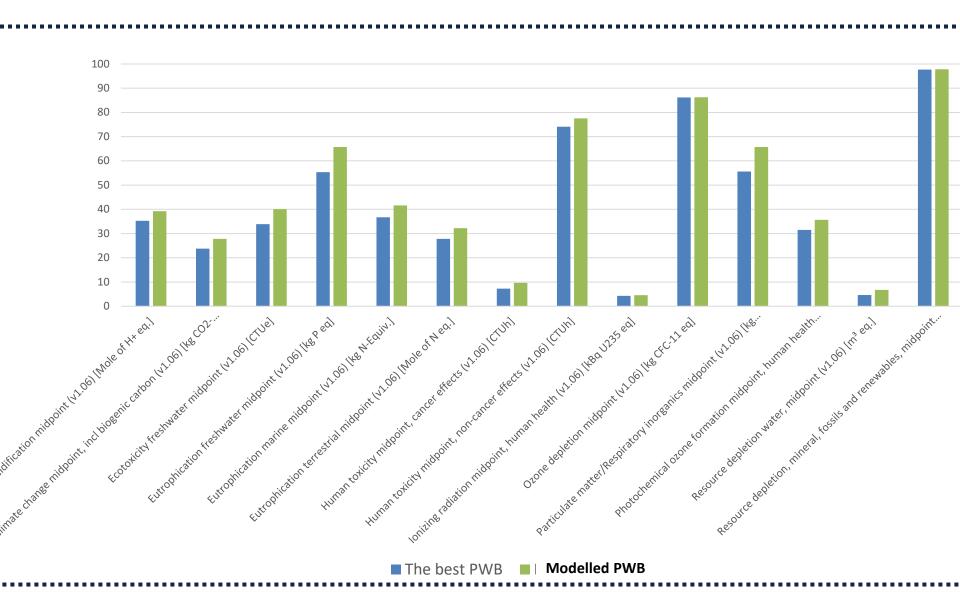
Life cycle impact assessment results

maki Consulting GmbH Life cycle expert services

Using ILCD/PEF recommended methods



PWB – sensitivity of assumption on PWB layers



Summary

- Data centres are globally relevant environmental impactors, growing further in relevance
- Focus for improvement so far is practically exclusively the use stage energy consumption
- Beyond energy and beyond Climate change, other impacts are similarly relevant
- For other impacts, the production stage is about of same relevance as use stage

Outlook: with use stage now being optimised, production gets even dominant and needs to get attention

Any questions?



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