

BEFORE STARTING

HOUSEKEEPING

- Turn on your system's sound to hear the streaming presentation
- **Questions?** Submit them into the question box!
- The webinar on Twitter [@ICTFOOTRPRINTeu](https://twitter.com/ICTFOOTRPRINTeu)



A lush green forest scene with a stream flowing over rocks in the foreground. Sunlight filters through the trees, creating a warm, golden glow. The stream is surrounded by mossy rocks and dense foliage.

ICT FOOTPRINT EU

European Framework Initiative for Energy & Environmental Efficiency in the ICT Sector

Webinar: Tools and Services for Energy Management

In partnership with:

Thursday, 20th October 2016



Your Moderator & Speakers

Silvana Muscella - Moderator
Founder & CEO
Trust-IT Services



Jaak Vlasveld - Speaker
Director
Green IT Amsterdam



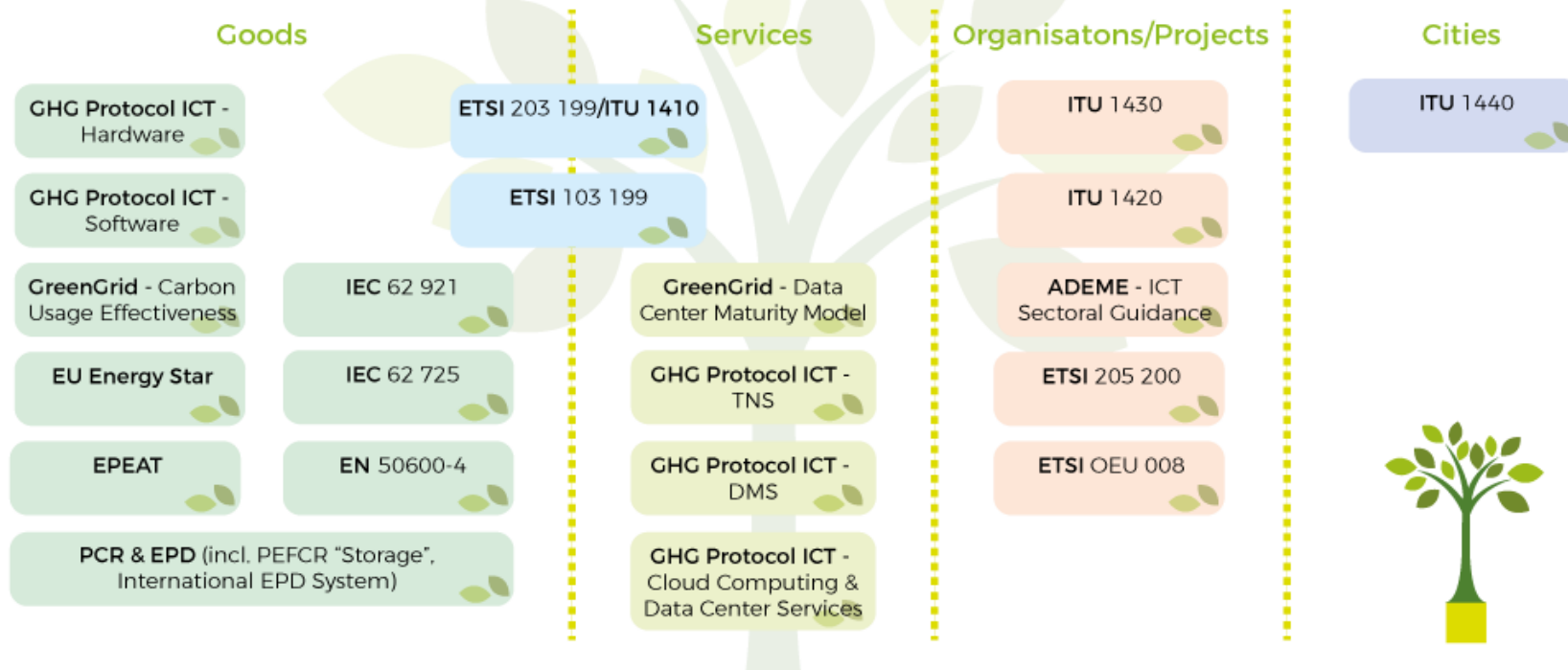
Rabih Bashroush - Speaker
Coordinator
Eureca Project



Map of ICT Standards

MAP OF ICT STANDARDS

Click on the ICT Standard you are interested in to go to the factsheet & read all the details



The ICTFOOTPRINT.eu initiative -In a nutshell

Mission

Become “THE” consolidated effort that, at European level, raises awareness on metrics, methodologies & best practices in measuring the energy and environmental efficiency of the ICT-sector, to facilitate their broad deployment & uptake.

Stakeholders



ICT Intensive SME



ICT Suppliers



Cities & Public Administration



Standard Development
Organisations

Helping you choose your Low Carbon & Energy Efficiency in ICT

Our main goals for the next 3 years



Create an **LCE* Support Framework Platform**

Informs end-users of the existence of the methodologies available & supports them in lowering barriers to entry



Raise **awareness**

educate and empower (prospective) SMEs (and all other end-users) with actions and showcases, as well as informative material to **promote green strategies**



Create an **aggregated community**

for solution providers and consumers in the field of energy and environmental efficiency in the ICT sector, with a **marketplace** of opportunities



Design user-oriented, online implementation of **footprinting methodologies**



Develop and implement a **sustainable business model** and leave a **lasting legacy**.

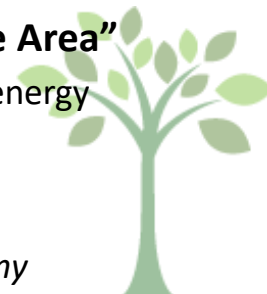


Interface and liaise with the relevant standards bodies (**SDOs**)



Develop a web platform with a **“Service Area”** **targeting SMEs** to help assess carbon and energy footprint and share experiences

** Low-Carbon Economy*



Main Outputs for our stakeholders



ictfootprint.eu



Marketplace

Buyer: Find sustainable ICT suppliers & publish ICT sustainable needs.
Seller: publish ICT sustainable services or procurements & search for clients.

Webinars

Know more on sustainable ICT: get practical guides from a highly qualified experts in the Sustainable ICT sector and learn how to apply them in your organisation.

Help Desk

In 5 languages

Get support about how to decrease your carbon footprint & implement ICT energy efficiency standards with Online Assistance (ENG, FR, ES, DE, IT).

Success Stories

Best practices in Sustainable ICT. Search how players like you got energy savings & carbon footprint reduction. Or even showcase your success story!

Self Assessment Centre

Measure your own carbon footprint and start learning how to become sustainable thanks to ICT standards & methodologies. **AVAILABLE SOON**

Join us and get energy savings by choosing low carbon ICT

Now Over to...

Jaak Vlasveld
Director
Green IT Amsterdam



Rabih Bashroush
Coordinator
Eureca Project





ICTFOOTPRINT EU

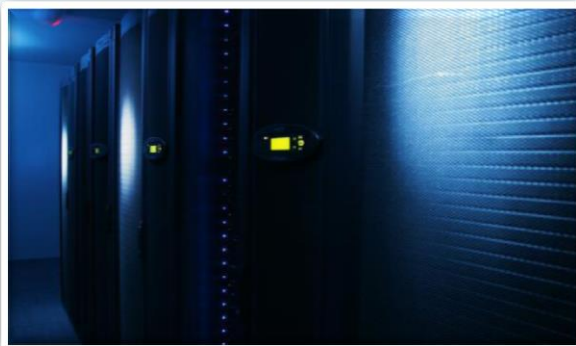
European Framework Initiative for Energy & Environmental Efficiency in the ICT Sector

Webinar: Tools and Services for Energy Management

Jaak Vlasveld

Thursday, 20th October 2016

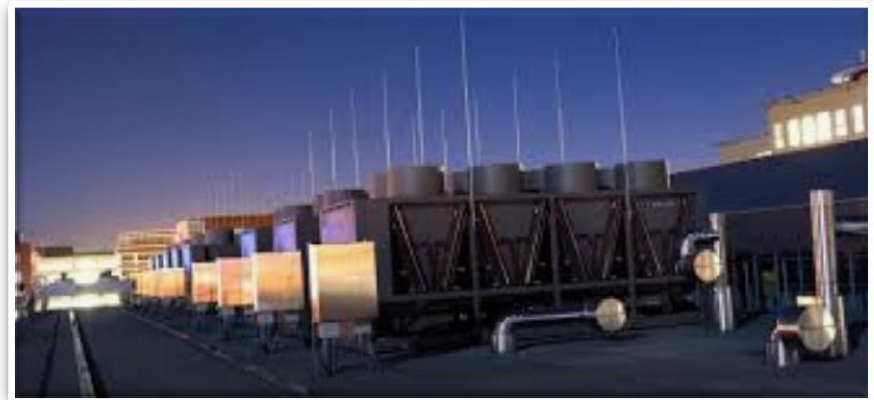
Our applications run on servers ...



... inside datacenters or server rooms ...



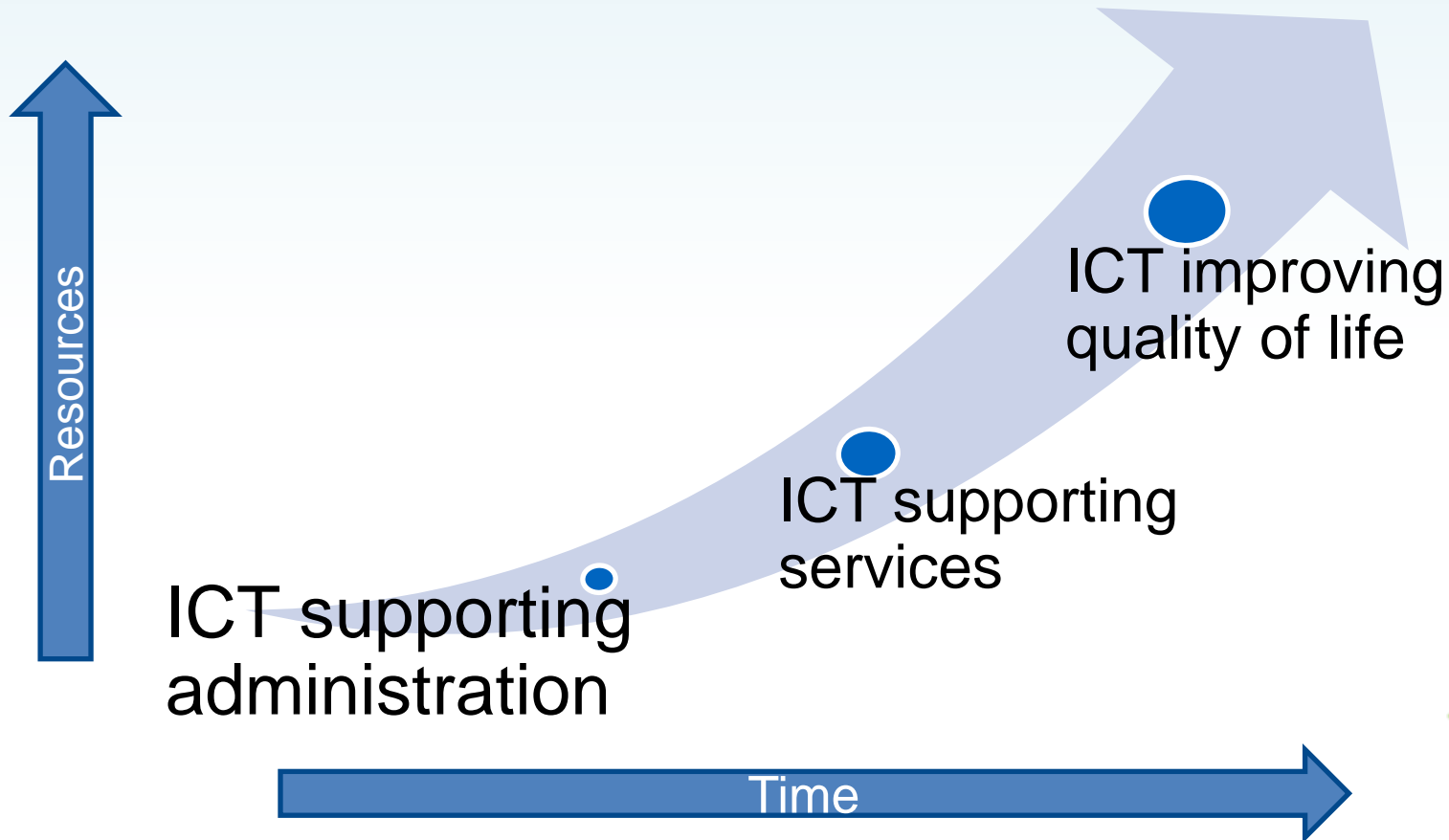
... with the infrastructure to keep the servers cool and safe ...



... and continuously supplied with power



ICT is everywhere

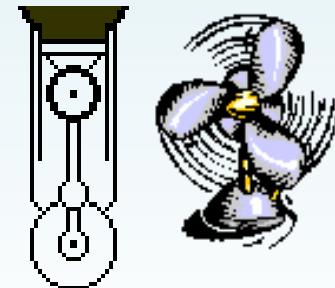
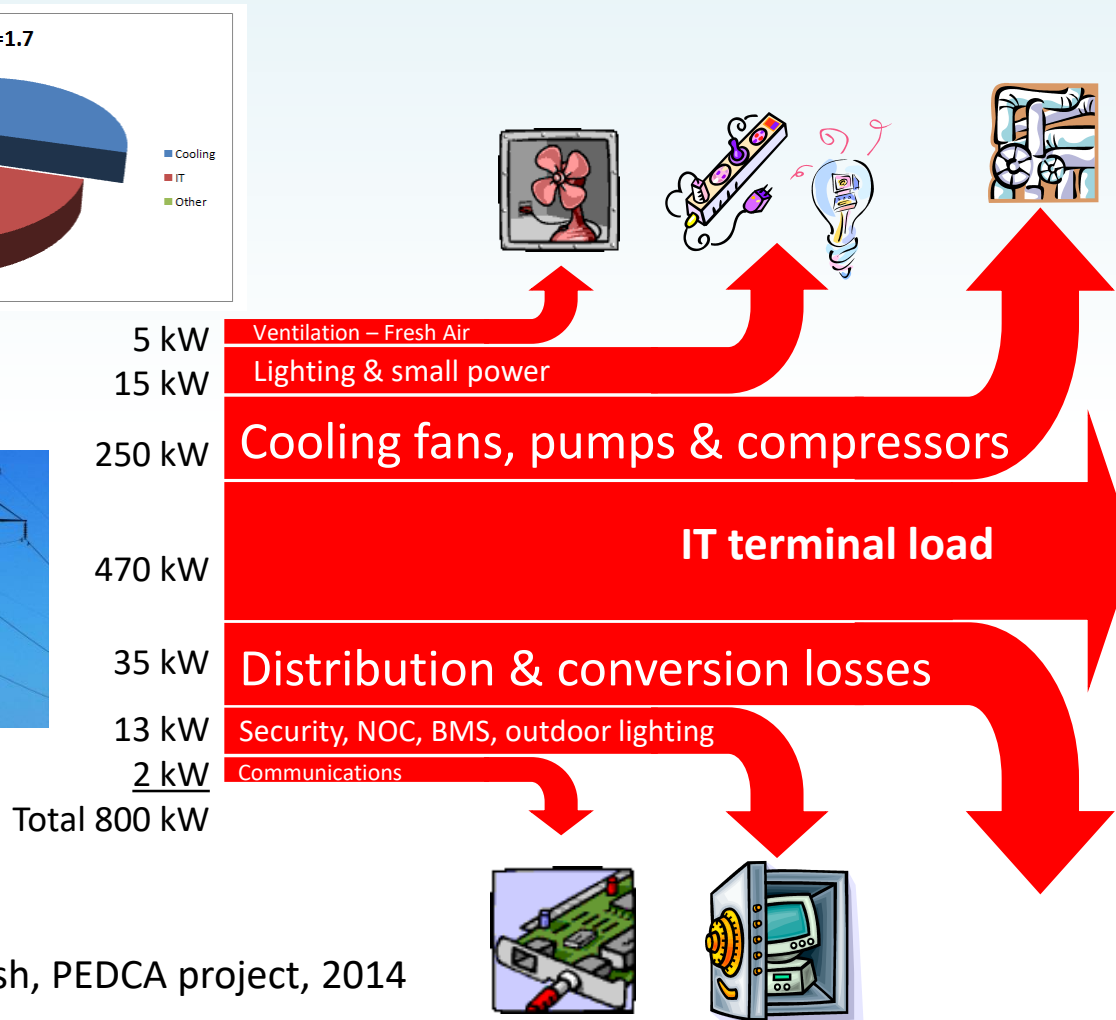
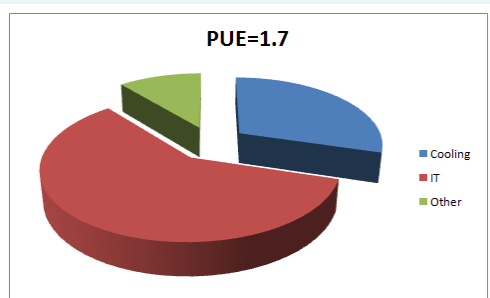


Energy efficiency: 3 core drivers

- Resources are finite
- Invest to earn back
- Green scales well



Dropping overhead => focus on IT load



Source: R. Bashrouh, PEDCA project, 2014

Example: green cloud stack



- Reduce service usage, reduce (virtual) resource consumption.
- Improve utilization of hardware while keeping SLA's
- Get the most compute resources for energy.
- Reduce energy overhead in central installations

Apply best practices

**And..
Iterate**

Software Improvement Group, for the Greening the Cloud project, www.greeningthecloud.nl



Shared testing environments

- Application energy efficiency through:
 - Software application adjustment
 - Tune host to application
 - Improve hardware
- Address continuity concerns through:
 - Testing
 - Adopting best practices



Example: SEFlab

Goal:

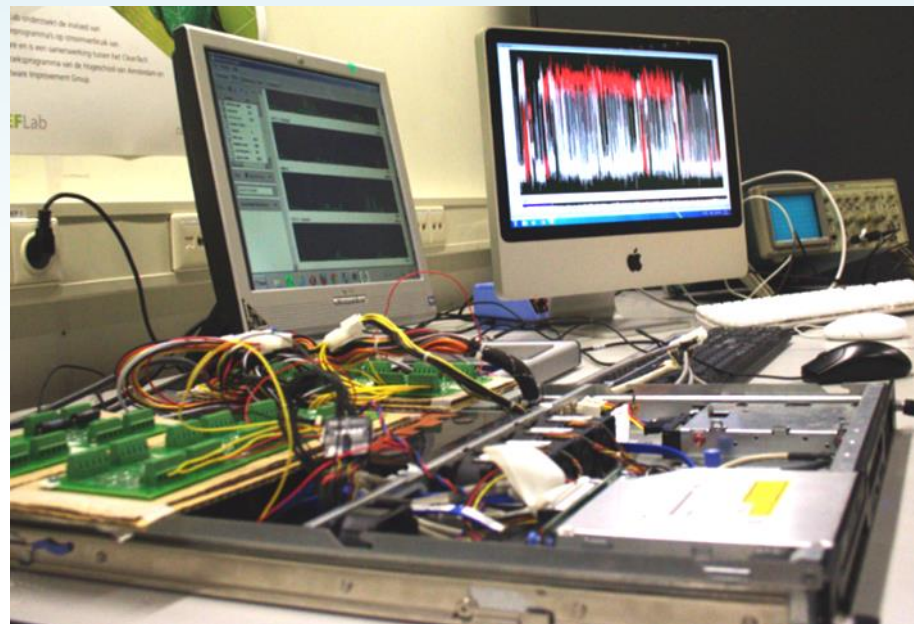
Development of applied knowledge about the energy consumption of server hardware caused by software.

Activities:

- Measurement expertise on servers.
- Fitting a multi-server platform with sensors.
- Performing energy analyses on software applications.

Results:

- Measurement platform for companies, uni's & students
- Software "Energy footprints" (register)
- Benchmarks → energy labels for software?
- Design rules for green software dev

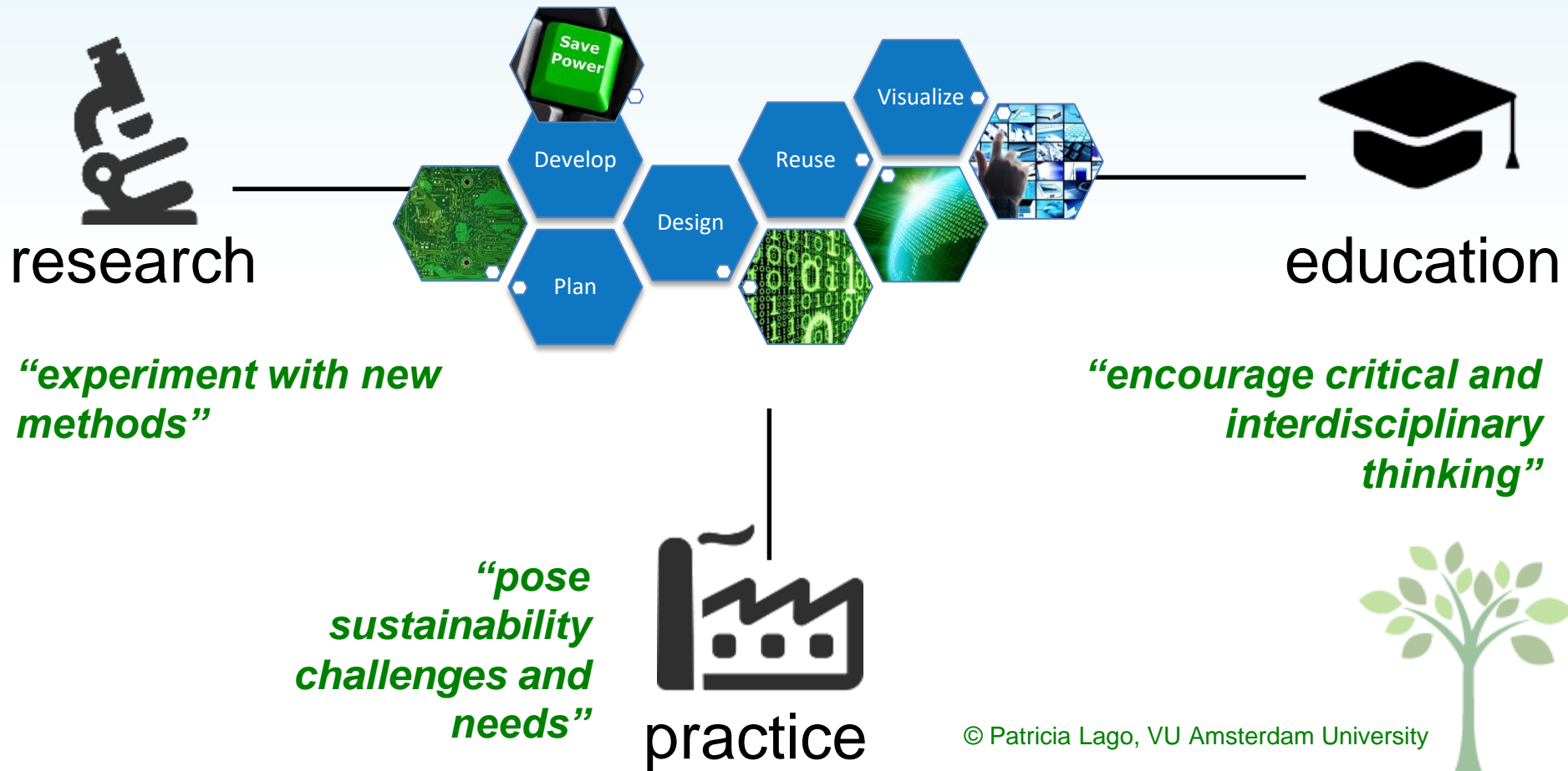


Source: Vergroening van IT, Cluster Green Software, R. van den Hoed, P. Lago, P. Grosso, 2015
www.clustergreensoftware.nl



Example: Green Lab @ VU Amsterdam University

Serious experimentation in software energy efficiency

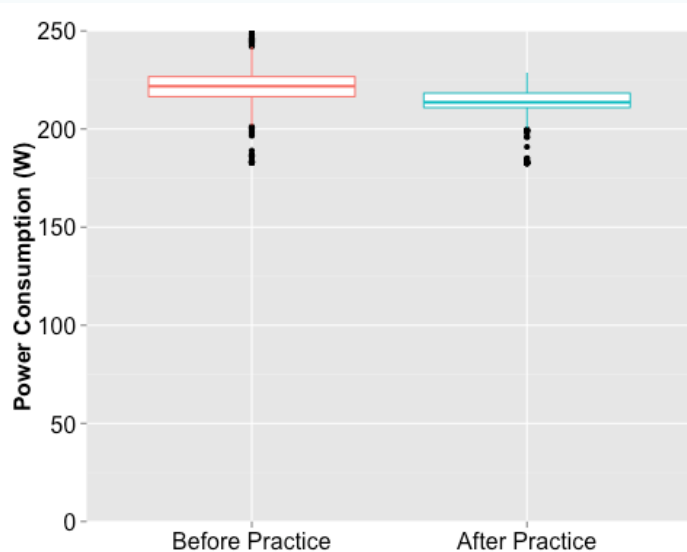


© Patricia Lago, VU Amsterdam University

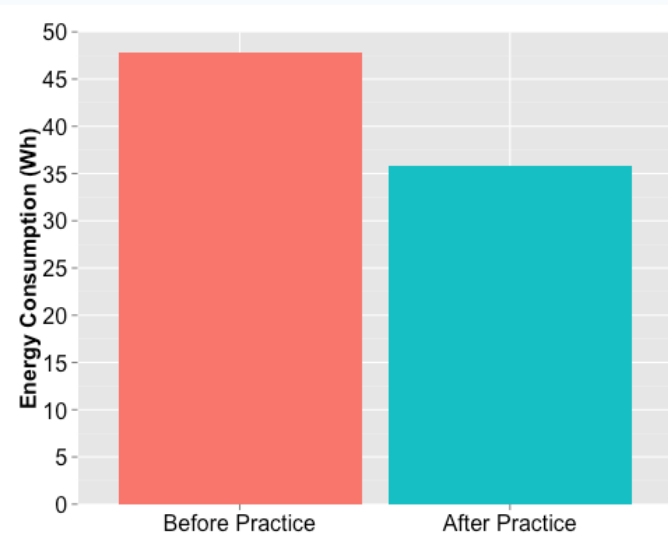
Example: Efficient database queries



```
select SQL_NO_CACHE a.old_id from text a, revision b  
where a.old_id = b.rev_text_id  
order by a.old_id;
```



3% Power savings



25% Energy savings

Source: Procaccianti G., Fernandez H., Lago P. "Empirical Evaluation of Two Best-Practices for Energy-Efficient Software Development". *Journal of System and Software*, 2016. Pre-print available on: <http://dare.uvu.vu.nl/handle/1871/54184>



Example: Static webpages vs CMS

- Evaluate energy impact of Content Management Systems
 - E.g. Wordpress vs. Static web pages
- Experiment: compare 2 different VMs
 - Different software stack
 - Same content

cobra

This is our blog

Where we write about stuff



Example Article

May 31

cobra

This is our blog

Where we write about stuff...



Example Article

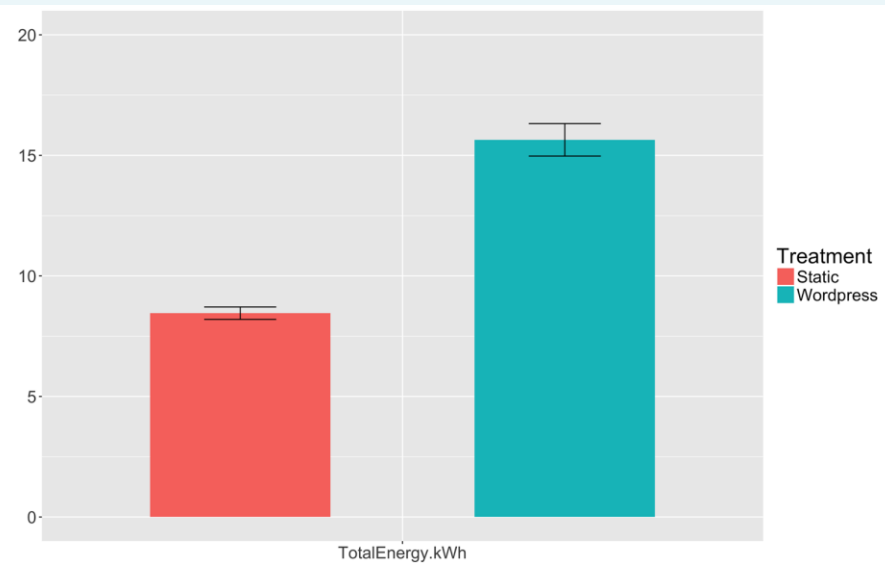
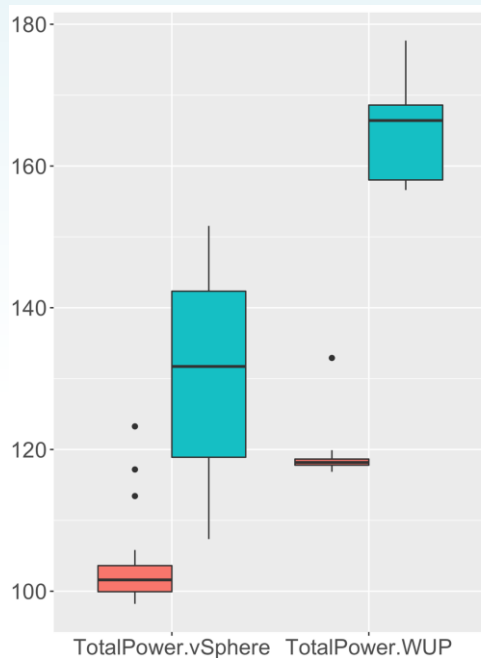
Jan 1

G. Procaccianti, VU Amsterdam; P. de Ridder, Cobra Systems, Measuring Green Software Applications, 7 July 2016

www.greeningthecloud.nl



Example: Static webpages vs CMS



28% Power savings

46% Energy savings

G. Procaccianti, VU Amsterdam; P. de Ridder, Cobra Systems, Measuring Green Software Applications, 7 July 2016

www.greeningthecloud.nl



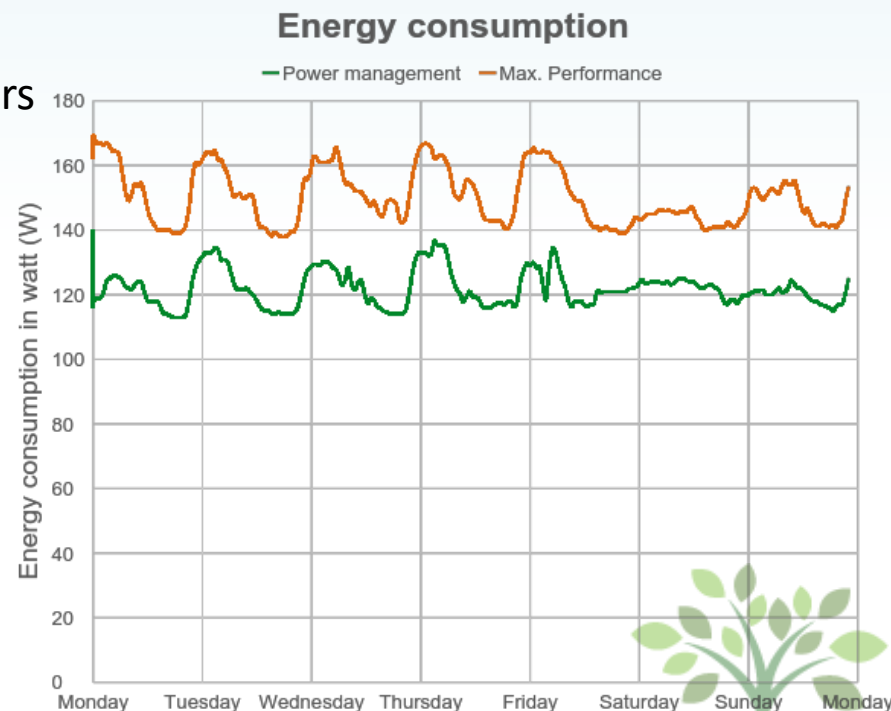
Example: Power Management saves up to 20% of energy

- SURFdrive, 17.000 users
- File storage application for NL higher education, similar to Dropbox
- 16 production servers
- Tested on web, database and storage servers
- Applicable to many types of servers
- More efficient use of resources
- No noticeable performance loss

“Power management, though typically switched off, can be expected to achieve 20% energy efficiency gains”

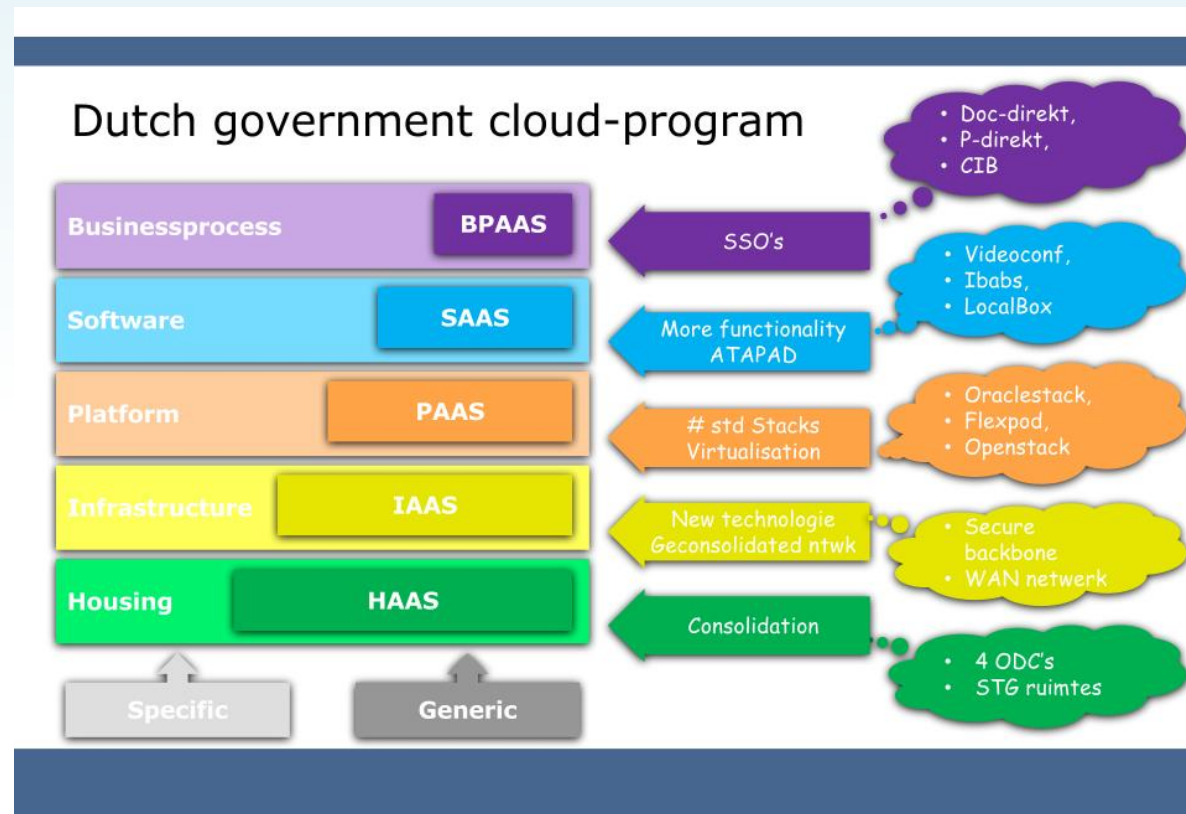
SURFsara, SURFdrive research “Power Management on Dell Servers”, Diederik de Graaf, Gerard van Westrienen

<https://blog.surf.nl/en/case-study-20-energy-savings-thanks-to-easy-trick/>



Example: Consolidation Dutch National Cloud

- From consolidation to energy savings
- From 64 to 4 DC's
 - 235 GWh => 128 GWh
 - 2014 => 2020
- Through:
 - innovative cooling
 - reuse of heat
 - advanced virtualisation
 - Application rationalization and optimization



Dennis Kerssens, Ministry of the Interior and Kingdom Relations, at the 5th Eureka Workshop in Amsterdam

<https://www.dceureca.eu/workshop/the-5th-eureka-workshop>

Leverage community support and tools

- Separation of concerns is efficient by default
 - Efficiency can be further optimized
 - Test, validate and replicate
- Need to involve the full chain
 - Infrastructure provider
 - ICT provider
 - ICT manager
 - End user
- Universities and labs are excellent tool providers



Thank you for your attention

Contact: Jaak Vlasveld

email: jvlasveld@greenitamsterdam.nl





ICTFOOTPRINT EU

European Framework Initiative for Energy & Environmental Efficiency in the ICT Sector

Supporting environmentally sound ICT procurement in the public sector: The EURECA project

Dr Rabih Bashroush

Webinar: Tools and Services for Energy Management

Thursday, 20th October 2016



Outline

- Why worry about energy efficiency?
- What are the challenges when it comes to public procurement?
- What is EURECA?
- Working together



Why worry about energy efficiency?





3%

Of world
Electricity is
used by
Datacenters

80%

Energy
Consumption
Reduction by
2050 compared
to 1990



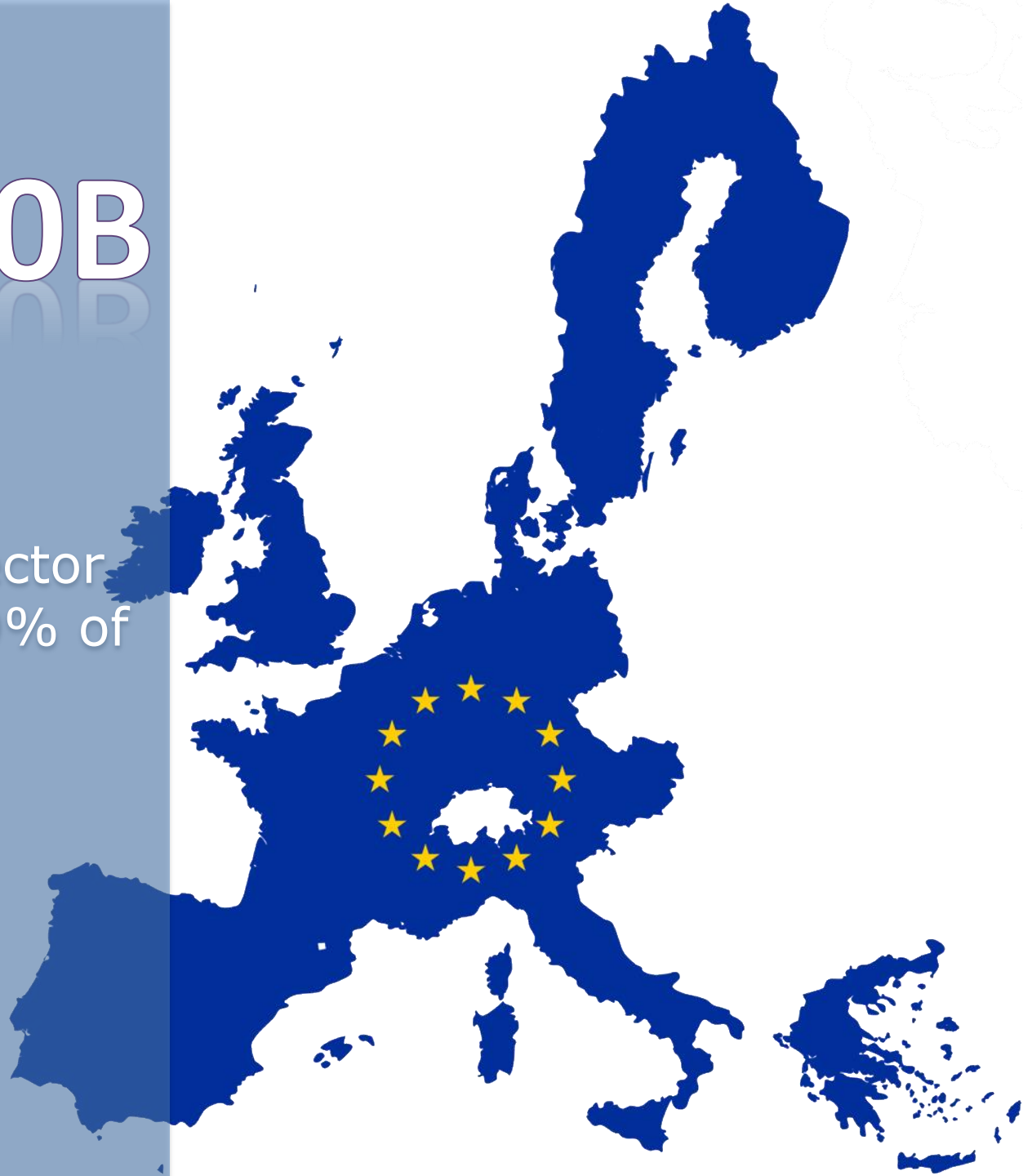
£90M

Annual UK
Universities ICT
Electricity bill
2012 (60% on
servers)



€2,200B

EU Public Sector
Spending (19% of
GDP)

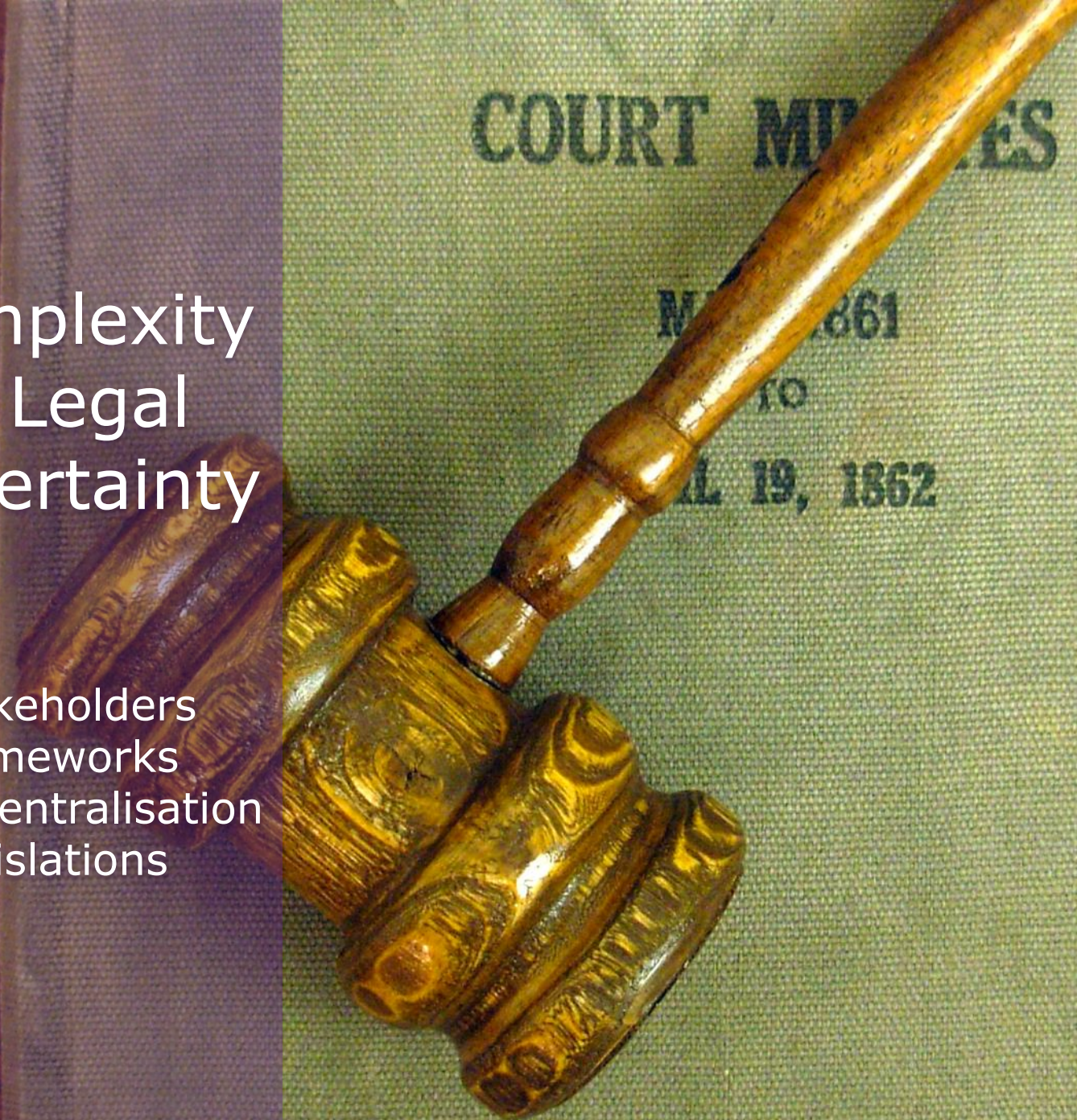


What are the challenges when it comes to public procurement?



Complexity & Legal Uncertainty

- Stakeholders
- Frameworks
- Decentralisation
- Legislations



Insufficient Priority

- Low budget (%)
- Split incentives
- Not Core business



Lack of Technical Expertise

- Standards
- Best practices
- Evaluation of Technologies



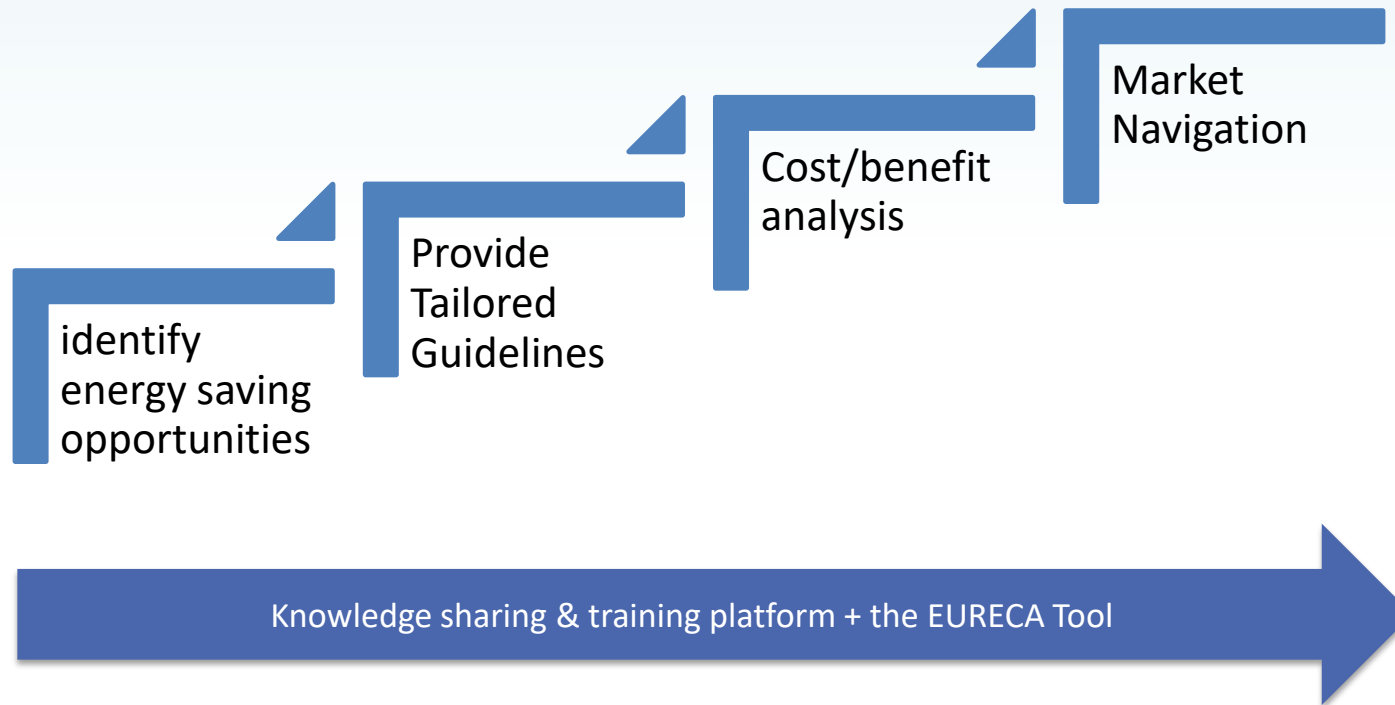
What is EURECA?



Project Overview

- Aim: Assist the public sector with the uptake of innovative energy efficient and environmentally sound data centre products and services.
- Project started on 1st March 2015 and will run for 30 months.
- Partners come from three main regions (Germany, Netherlands and UK), with wider EU focus.

Approach

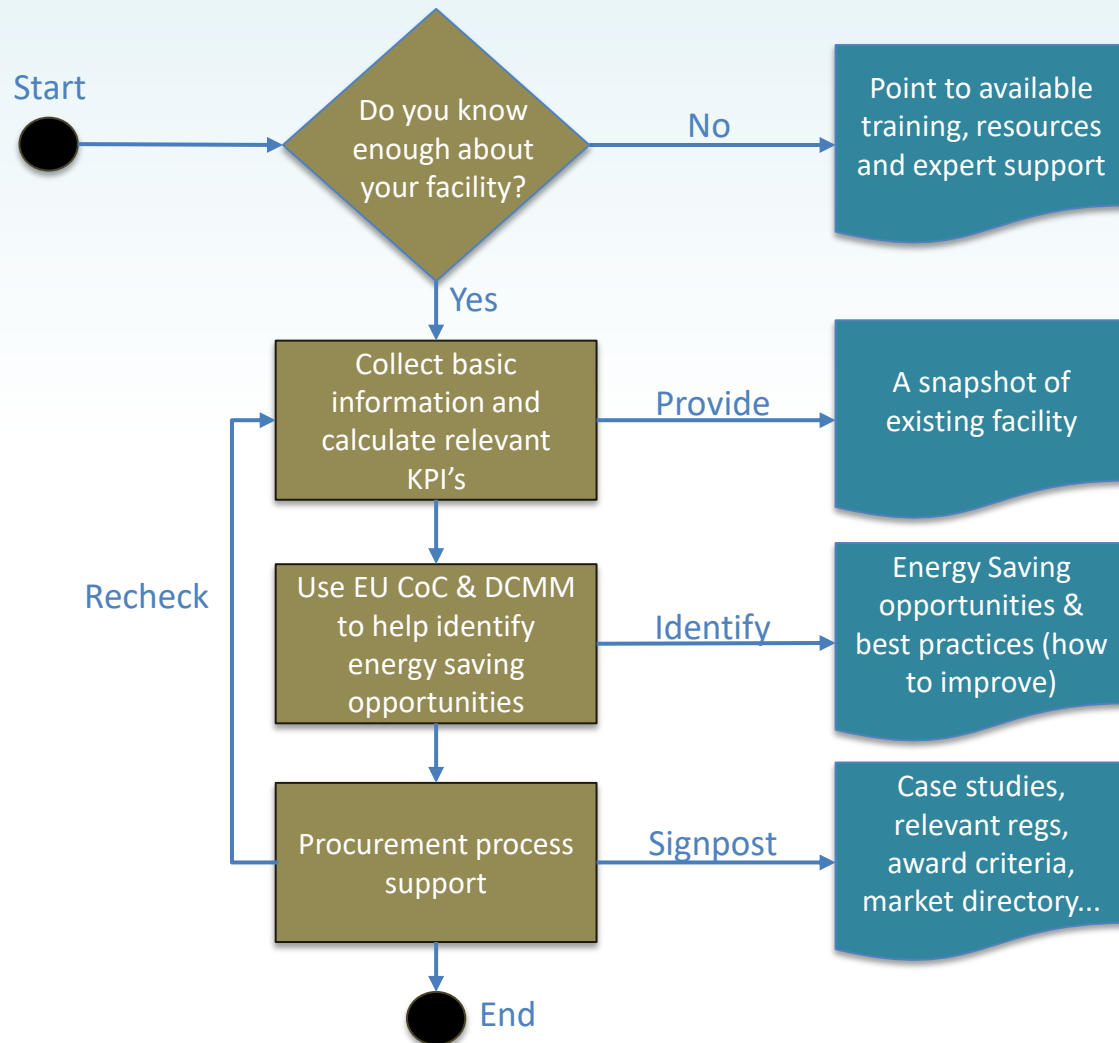


Knowledge Sharing & Training Events

Date	Location
June, 2015	London
November, 2015	Riga
February, 2016	Turin
May, 2016	Dublin
September, 2016	Amsterdam^
November, 2016	Paris^
February, 2017	Stockholm^
May, 2017	Barcelona^
August, 2017	Brussels^



The EURECA Tool



Working together

- Looking for public sector “champions” in this field
- To drive knowledge sharing and networking
- Help steer and tailor the EURECA tool design and results
- Please register your interest at:
<http://www.DCEURECA.eu>
- EURECA Tool: <https://tool.dceureca.eu>



Thank you for your attention

Contact

email: r.bashroush@qub.ac.uk



Questions to Dr Rabih Bashroush

Question 1

Can you tell me what type of people you are expected to come along to your multiple training events that you have planned & have listed ? so we can invite our listeners to join?

Question 2

Those that do complete the EURECA tool, would you agree that they could serve as a Success Story that we may showcase as part of the ictfootprint.eu results?



Questions to Jaak Vlasveld

Question 1

Europe, as part of the DSM, is driving forward a European Open Science Cloud (EOSC) for the future, how feasible could it be to apply your SEFlab or Green Lab initiatives & propose them to all NGIs (national Grid initiatives) across the EU? this would be very interesting in my opinion.

Question 2

Your advice Jaak - for an Organisation, how much to look for savings from adopting specific products & software applications or how much to look at re-shaping processes, digitising processes & overall internal organisation?



THANK YOU!

STAY TUNED FOR REGULAR UPDATES

the future is *sustainable!*

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