

City applications

Reducing the footprint


CONSORTIUM GREEN IT REGIO AMSTERDAM

OUR MISSION

Increasing energy efficiency and decreasing carbon emissions
by scouting, testing and exploring smart IT solutions

Because IT plays an increasingly important role in our efficient and smart society.

THIS IS WHAT WE DO

-  Scouting innovative technology
-  Creating piloting and business opportunities
-  Sharing through our network and showcasing good practices
-  Creating opportunities to demonstrate commitment to our participants' sustainability goals

We help the Amsterdam region meet their energy transition goals in 2020:

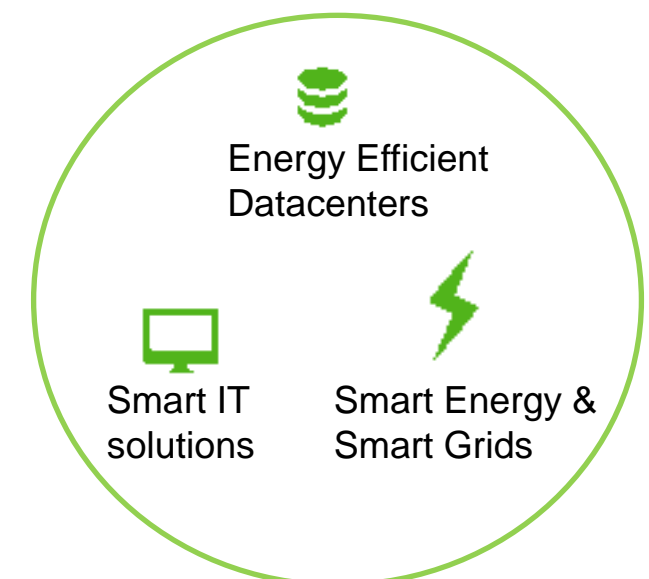
↑ 20%

Renewable energy

↓ 20%

Energy consumption

Greenit
amsterdam region

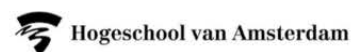


40+ consortium participants
Supported by our Alliance Partners

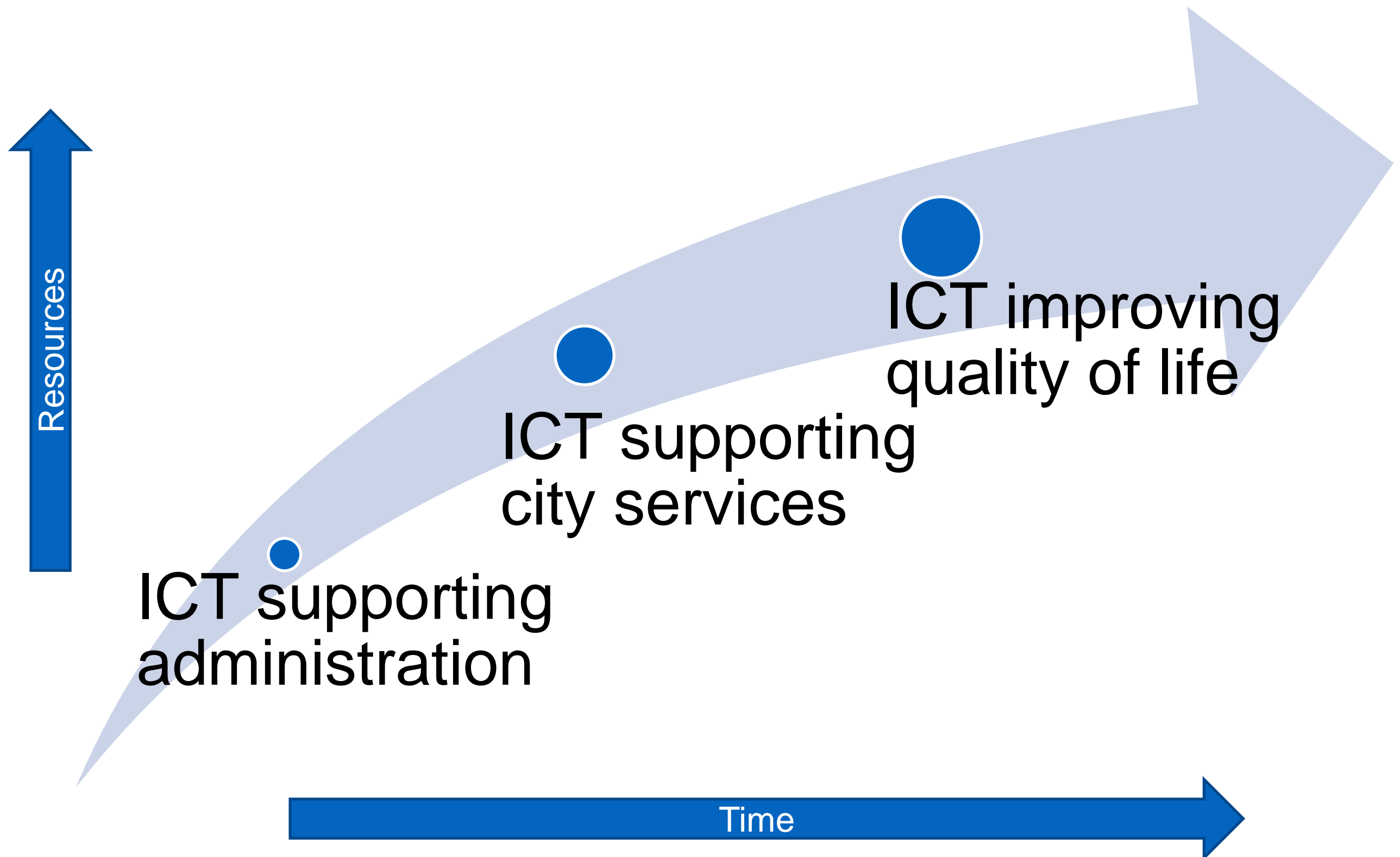
Cooperating on greening IT in Amsterdam started in 2010

Greenit
amsterdam region

THE CONSORTIUM



Smart cities have more IT



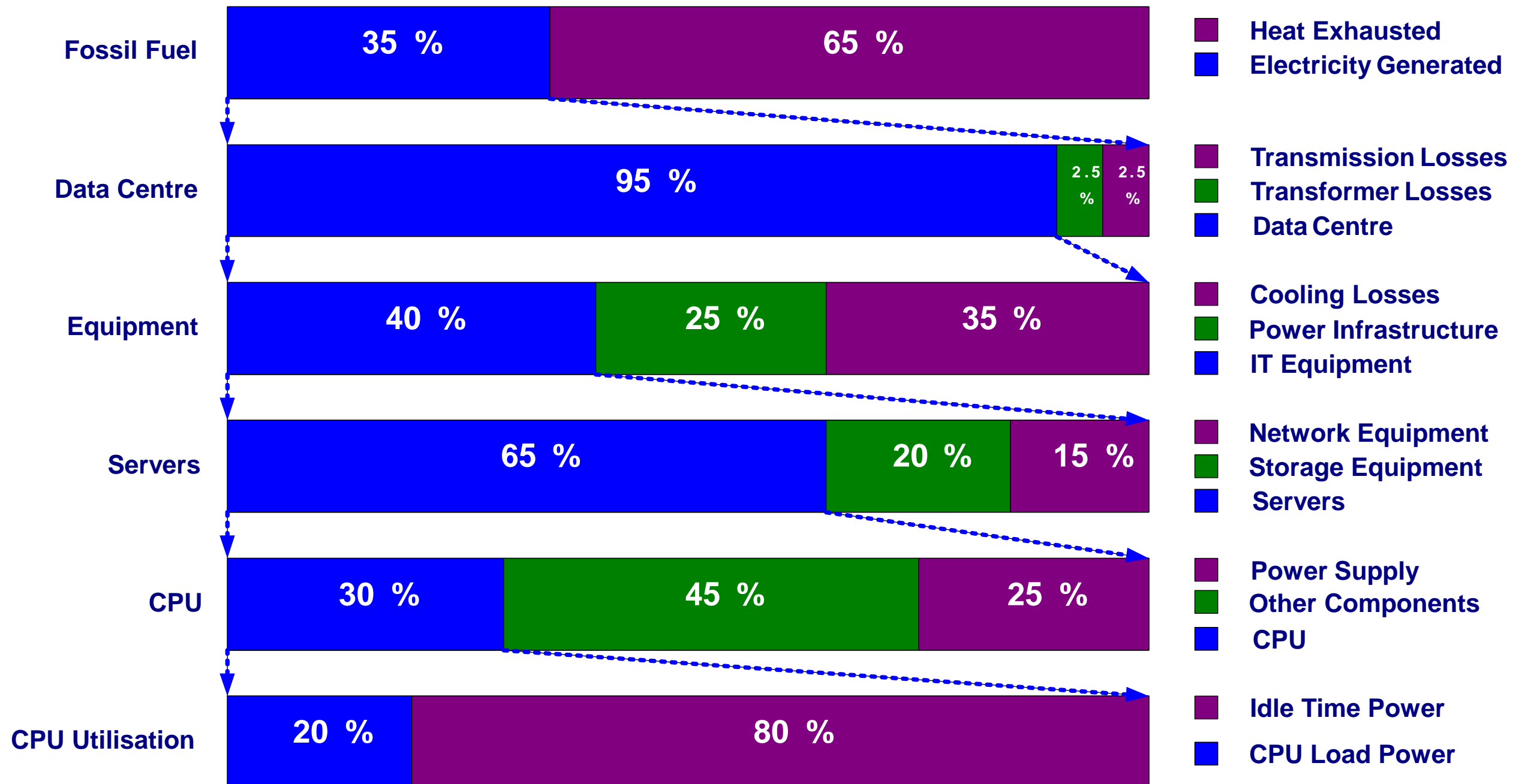
Smarter cities have green IT

Walk the talk

Invest and earn back

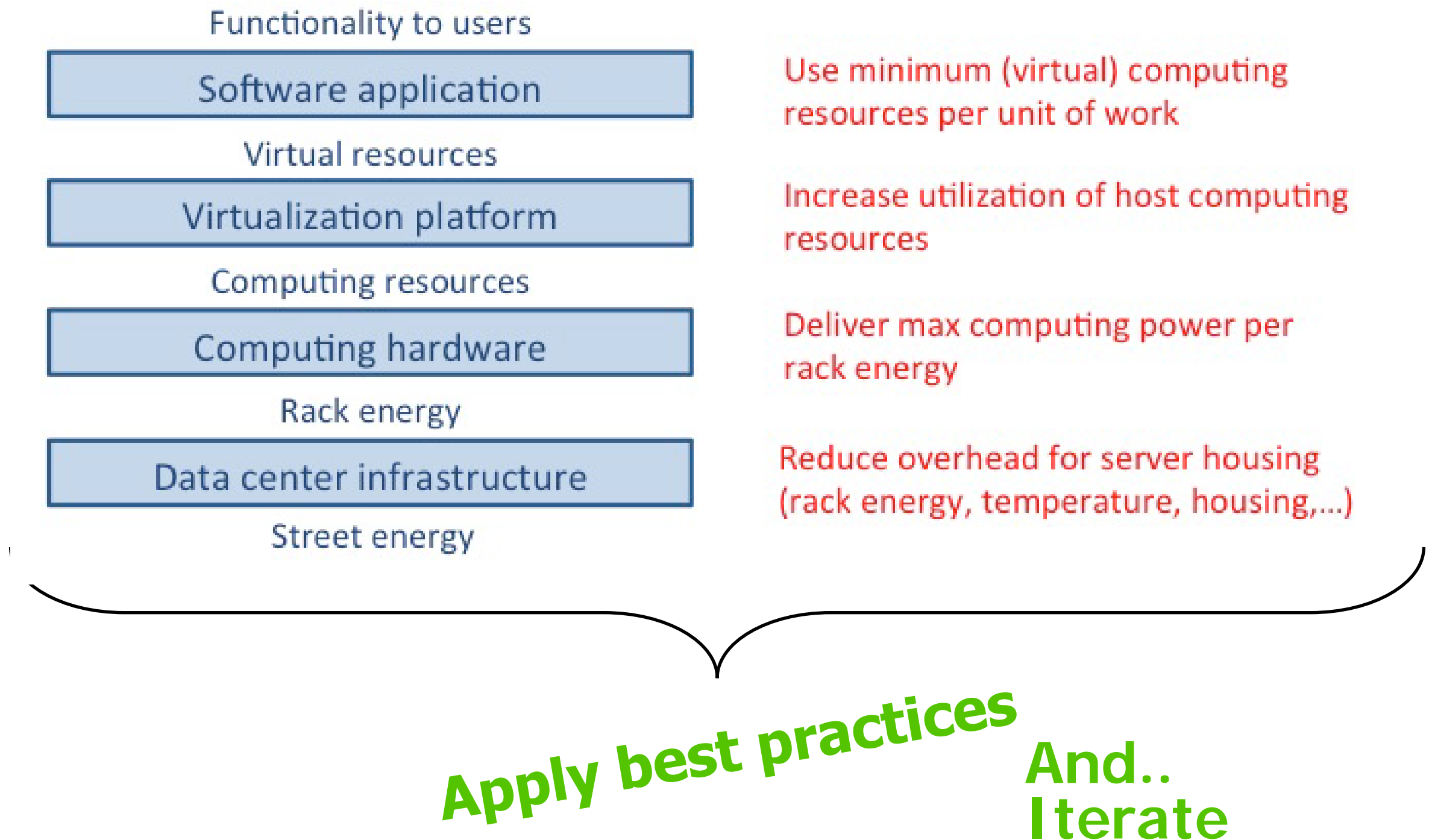
Resources ARE finite

ICT Energy Loss Chain

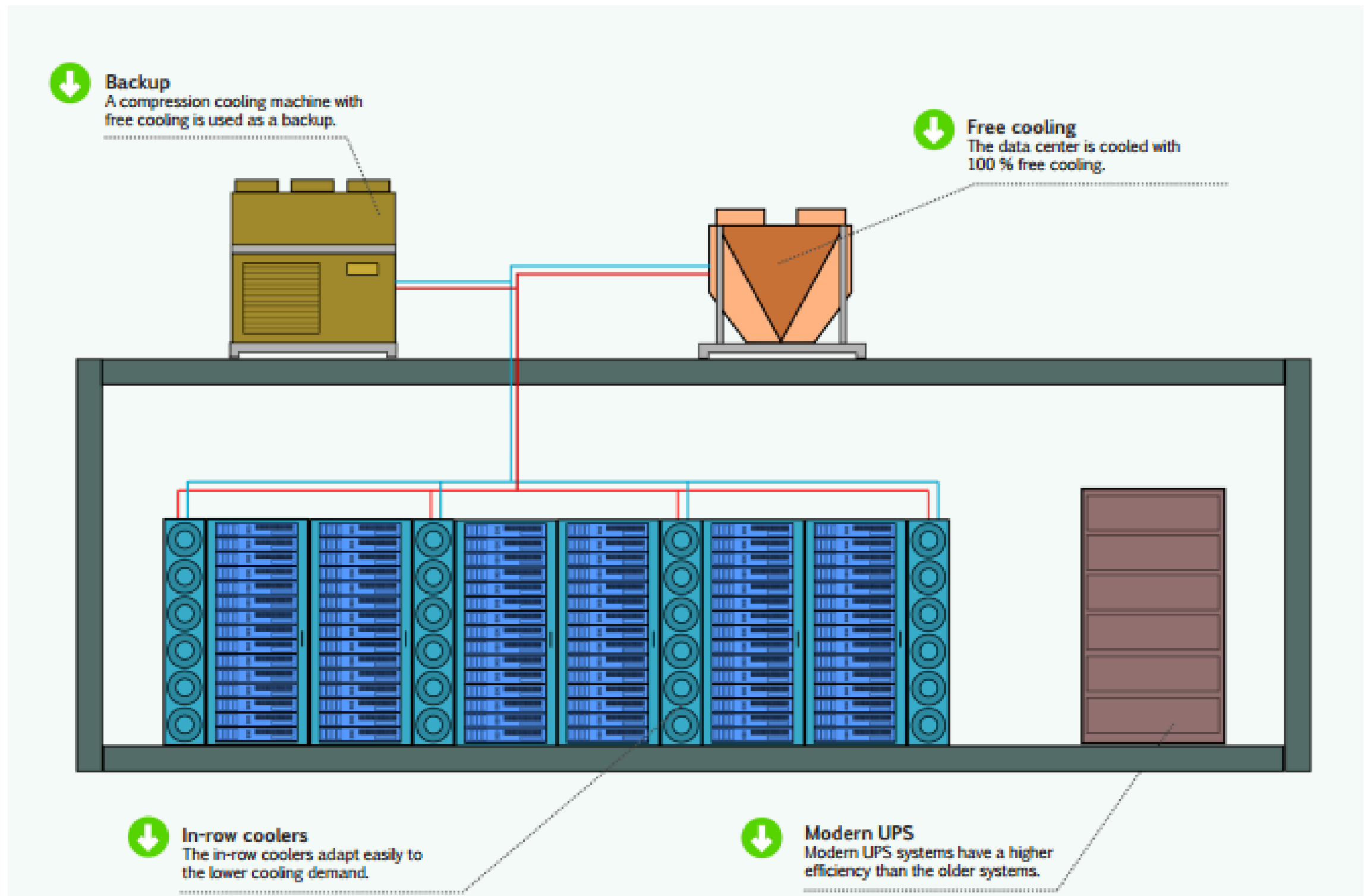


Source: British Computer Society

Green Cloud Model – the full-stack approach



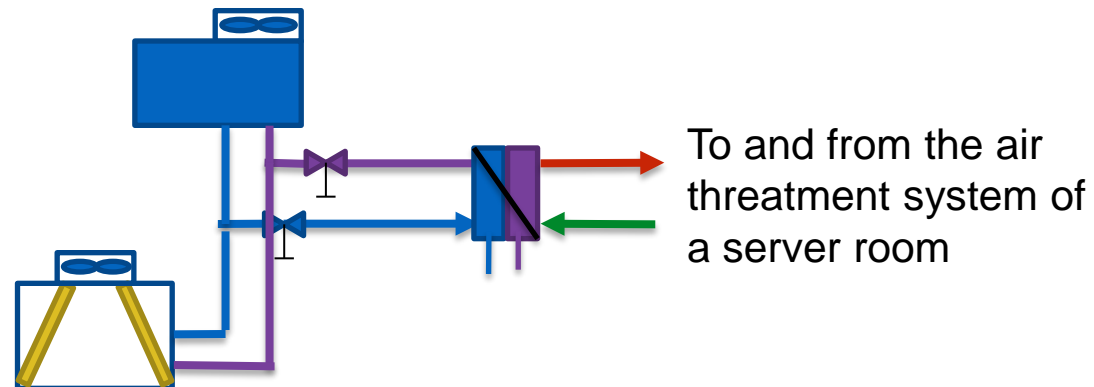
Retrofitting ICT infrastructure



Retrofitting ICT infrastructure



Compression coolers



	Air cooling retrofit
Investing	< 1600 €/kW ict
Annual saving on energy costs	Ca. 480 €/kW ict
Emission reduction CO ₂	Ca. 2,6 ton/kW ict

	Adding free cooling
Investment	< 1000 €/kW ict
Annual saving on energy costs	Ca. 430 €/kW ict
Emission reduction CO ₂	Ca. 2,3 ton/kW ict

Green Deal Datacenters 2012-2014

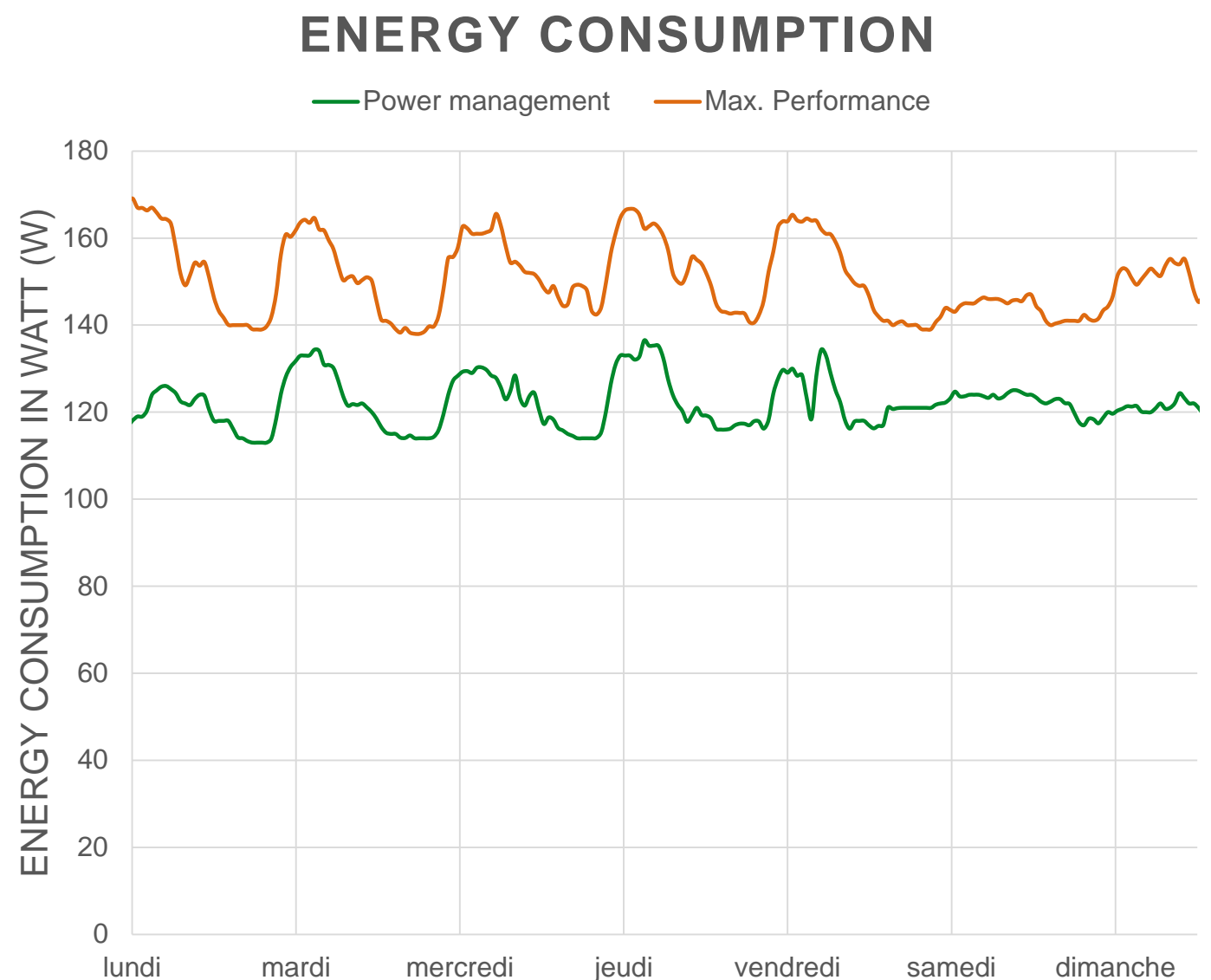
- Examples from practice
- Including: adding free cooling to an existing datacenter
- Many other possible retrofits are documented

Report: [Reorganizing computer rooms and datacenters in an energy efficient way](#)

Optimize server energy consumption

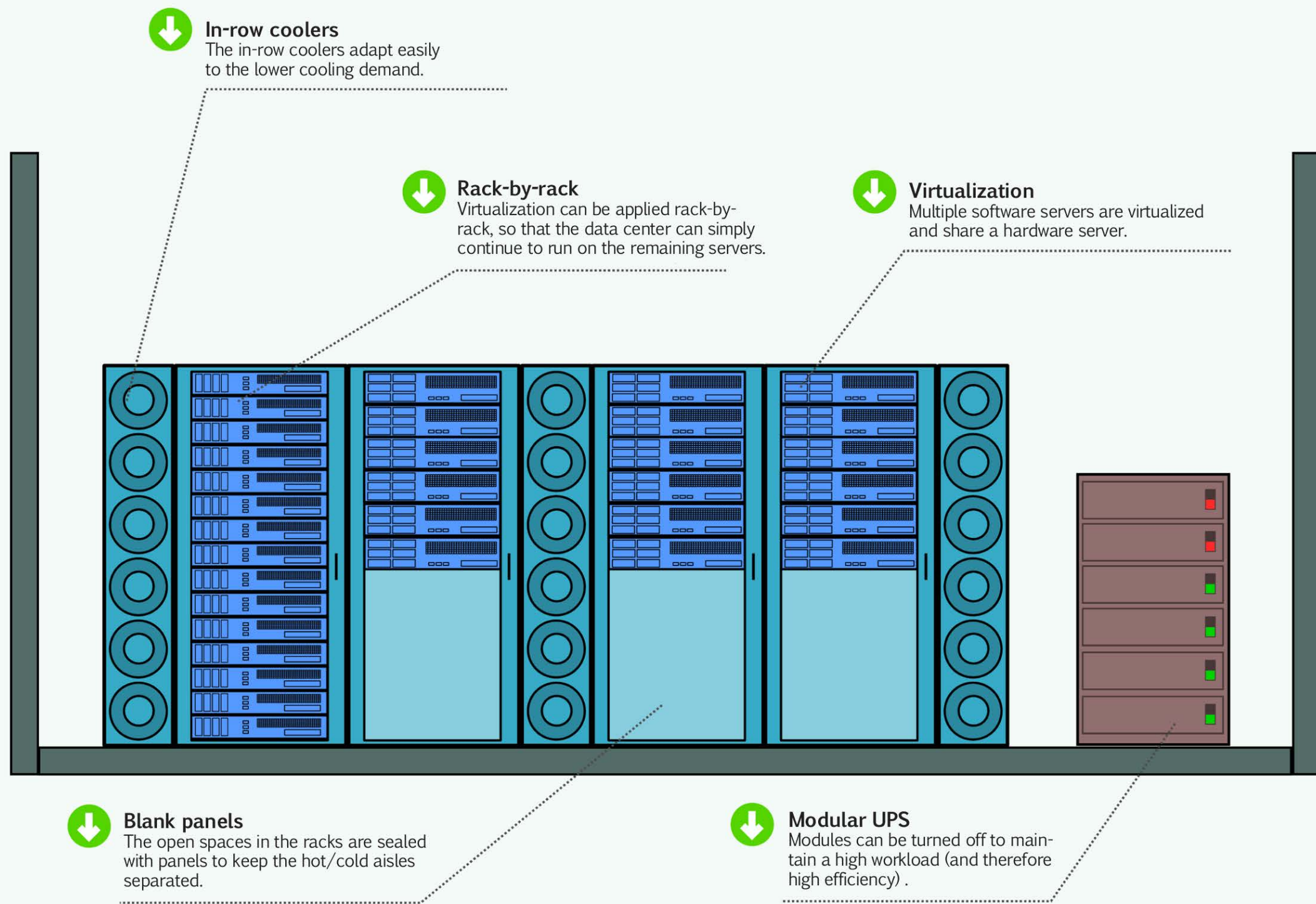
Case study: Power Management saves up to 20% of energy

- 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 noticable 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

Virtualize servers

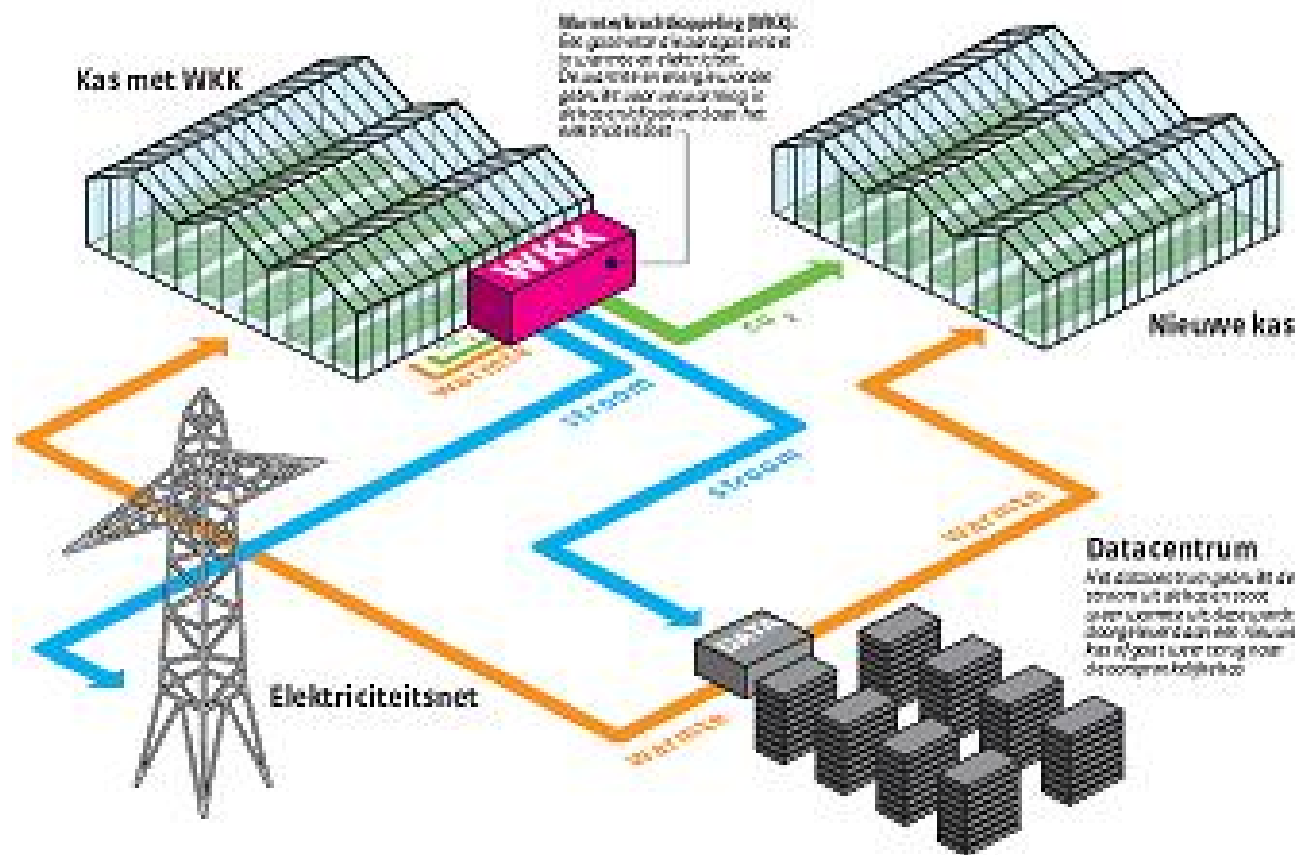


Case for 1 MW DC with PUE 1.42; investment earned back in less than 2 years
Report: [Reorganizing computer rooms and datacenters in an energy efficient way](#)

Increase software energy efficiency

- Hardware uses energy **because software tells it to**
- Software inefficiency grows faster than hardware efficiency
- [Greening the Cloud](#) investigated cases on software development and hosting
 - Practical results published on [July 7](#)
 - Scientific community meets 29/8/2016 – 1/9/2016
 - <http://2016.ict4s.org/>
 - More information: <http://www.greeningthecloud.nl/publicaties/>

Tomorrow's innovative, holistic approaches to ICT



Datacenters can and should provide **energy flexibility** services to support the energy grid during the **energy transition**

<http://www.geyser-project.eu/>

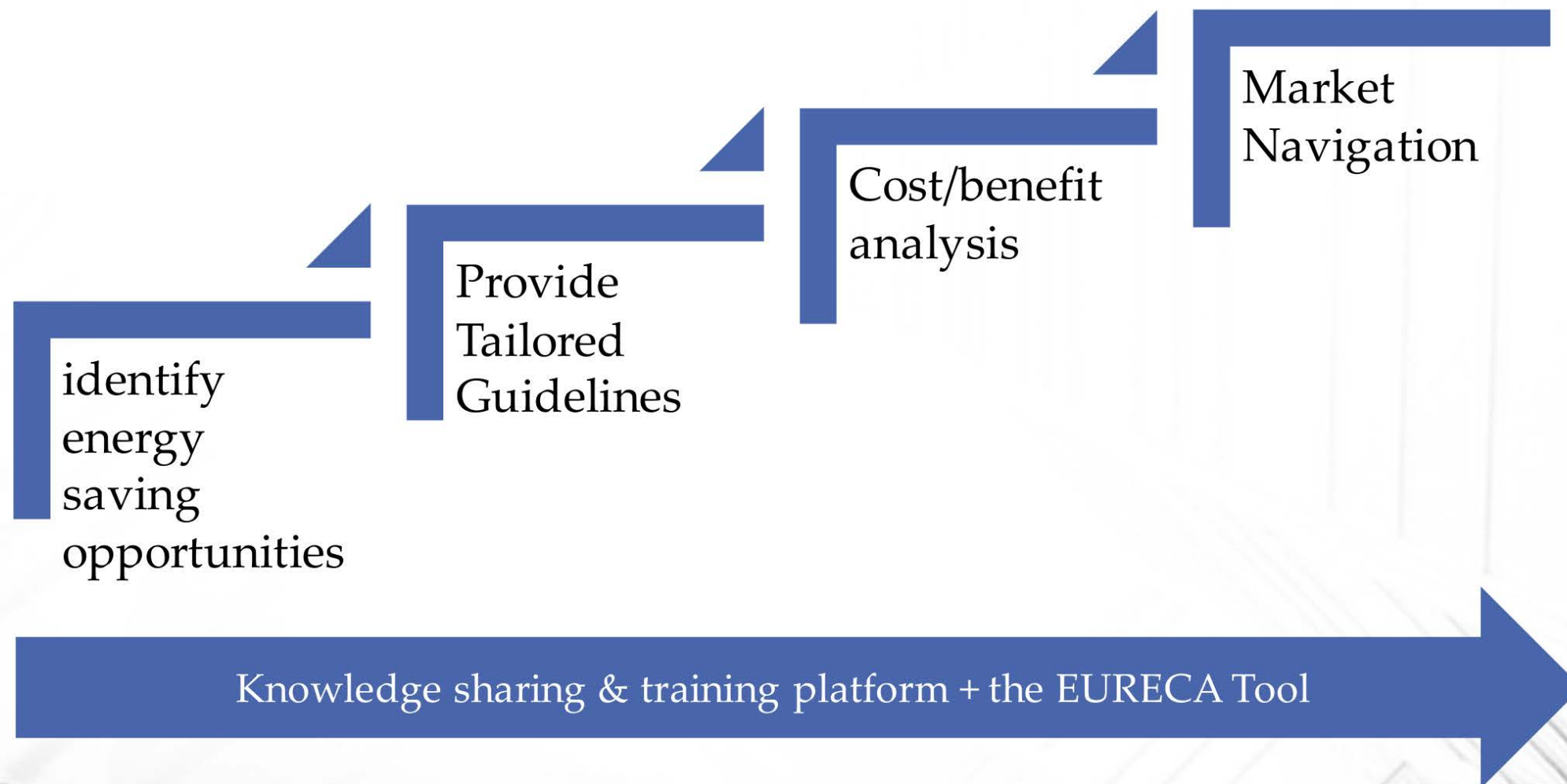
<http://www.linkedin.com/groups/Networked-Data-Centres-Smart-Grids-7485057>



Procure green products and services



EURECA!



Public sector support to innovative datacenters: <http://www.eureca-project.eu>



Cities need green, Smart City ready ICT

For more information on the cases:

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