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

ICTFOOTPRINT.EU

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

Webinar: Low Carbon ICT Green Rating Investment Tool, Carbon Fee Report & Data Centers

In parternship with:

Tuesday, 21st November 2017

TRUST EPC SOUTH

Microsoft

Andget

Speakers

Jakub Bartnicki
Energy & Built Environment Services Manager
Trust EPC South & Bureau Veritas

Adina Braha-Honciuc
Government Affairs Manager – EU Policy
Microsoft

Derek Webster
CEO - Data Center Consultancy Andget
Former EMEA Head of Data Center Development - YAHOO
Former Board member - EUDCA

Silvana Muscella - Moderator
Founder & CEO
Trust-IT Services

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

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 (EN, 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

ICTFOOTPRINT.EU

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

Green Rating for Energy Performance Contracts
Standardising your technical building improvement

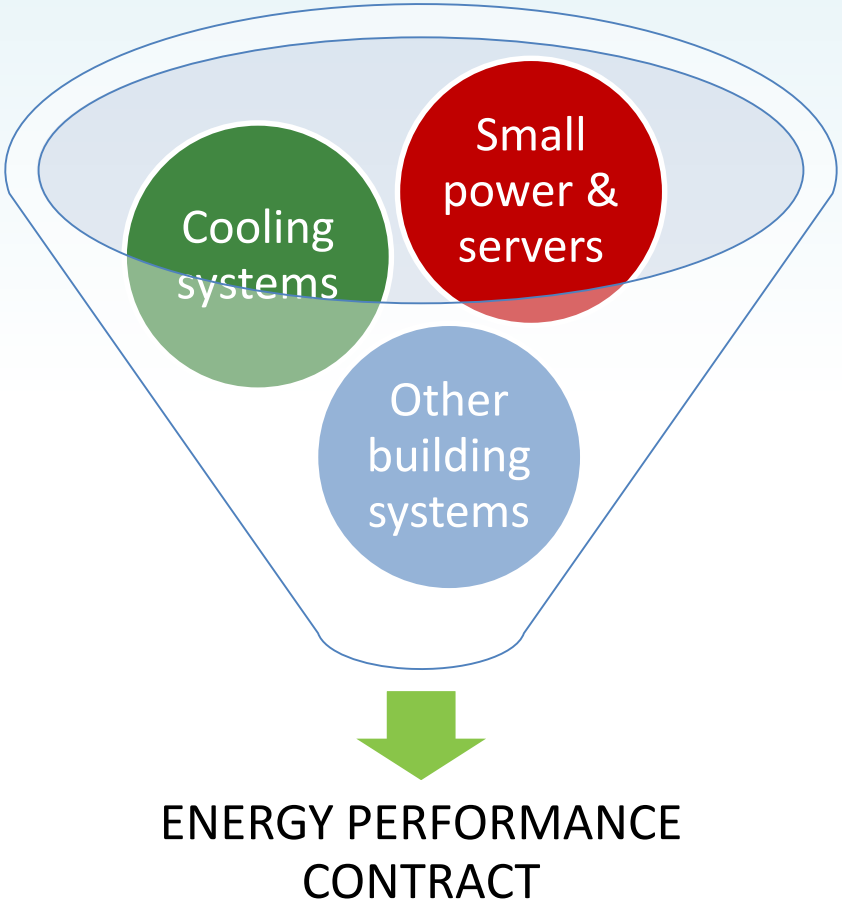
Jakub Bartnicki
Bureau Veritas & Trust EPC South

Tuesday, 21st November 2017

TRUST EPC SOUTH

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649772

EPCs in ICT intensive organisations

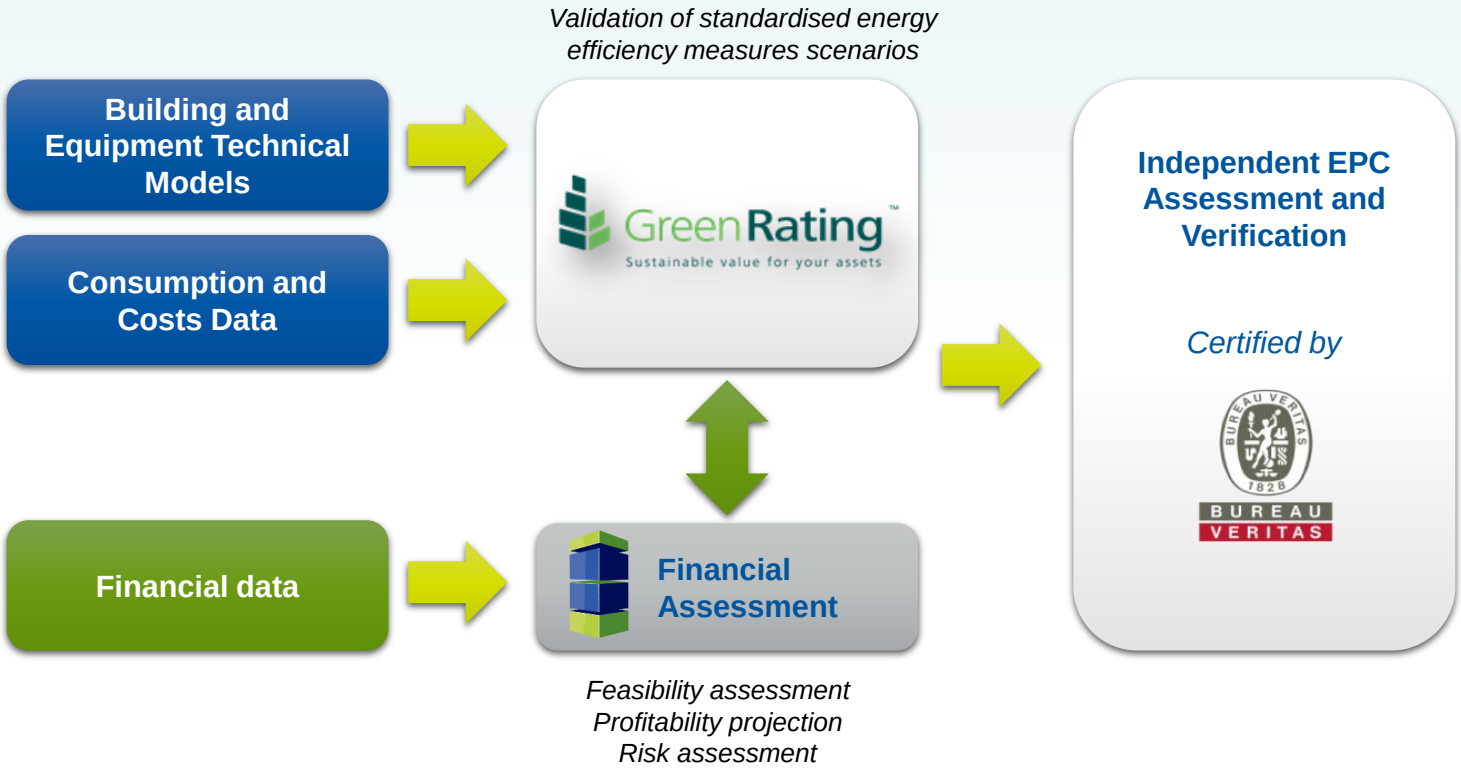


Trust-EPC-South

- The Trust EPC South project aims to unleash the tertiary sector market potential for energy efficiency investments in Southern Europe by developing a new investment assessment instrument backed by an established building rating methodology (Green Rating™). Such instrument shall support energy service companies (EPC providers and facilitators), financing institutions and tertiary market actors thanks to the application of a standardised methodology to the investment assessment and decision processes, ultimately allowing to reduce barriers to energy efficiency investments.

- Trust EPC South is a project financed by the European Union's Horizon 2020 programme

EPC Assessment



Link to the GREPCon video: https://www.youtube.com/watch?v=rD2aw5_NP68

EPC Assessment

GREPCon PROJECT RATING

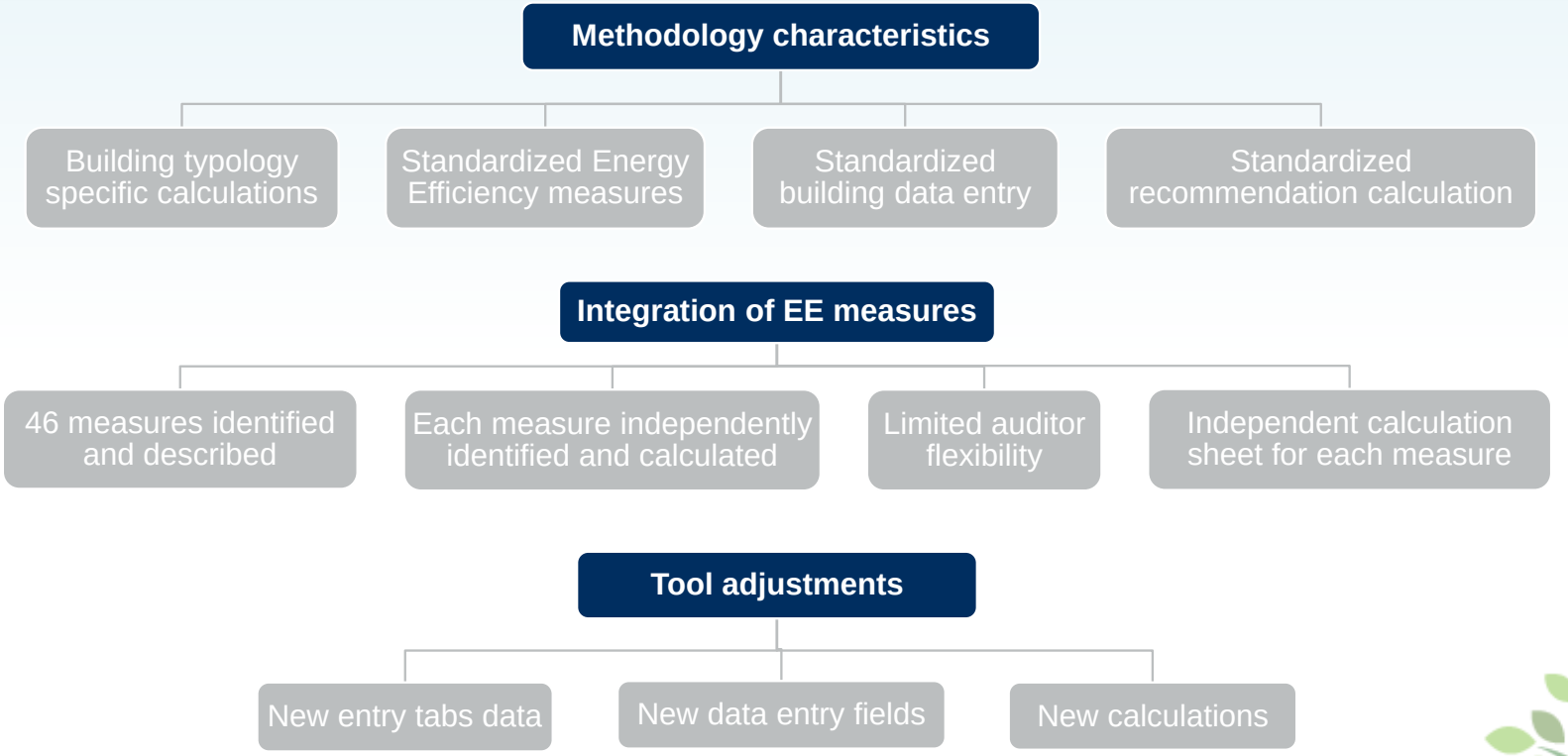
XXX

Energy Performance Contract Potential

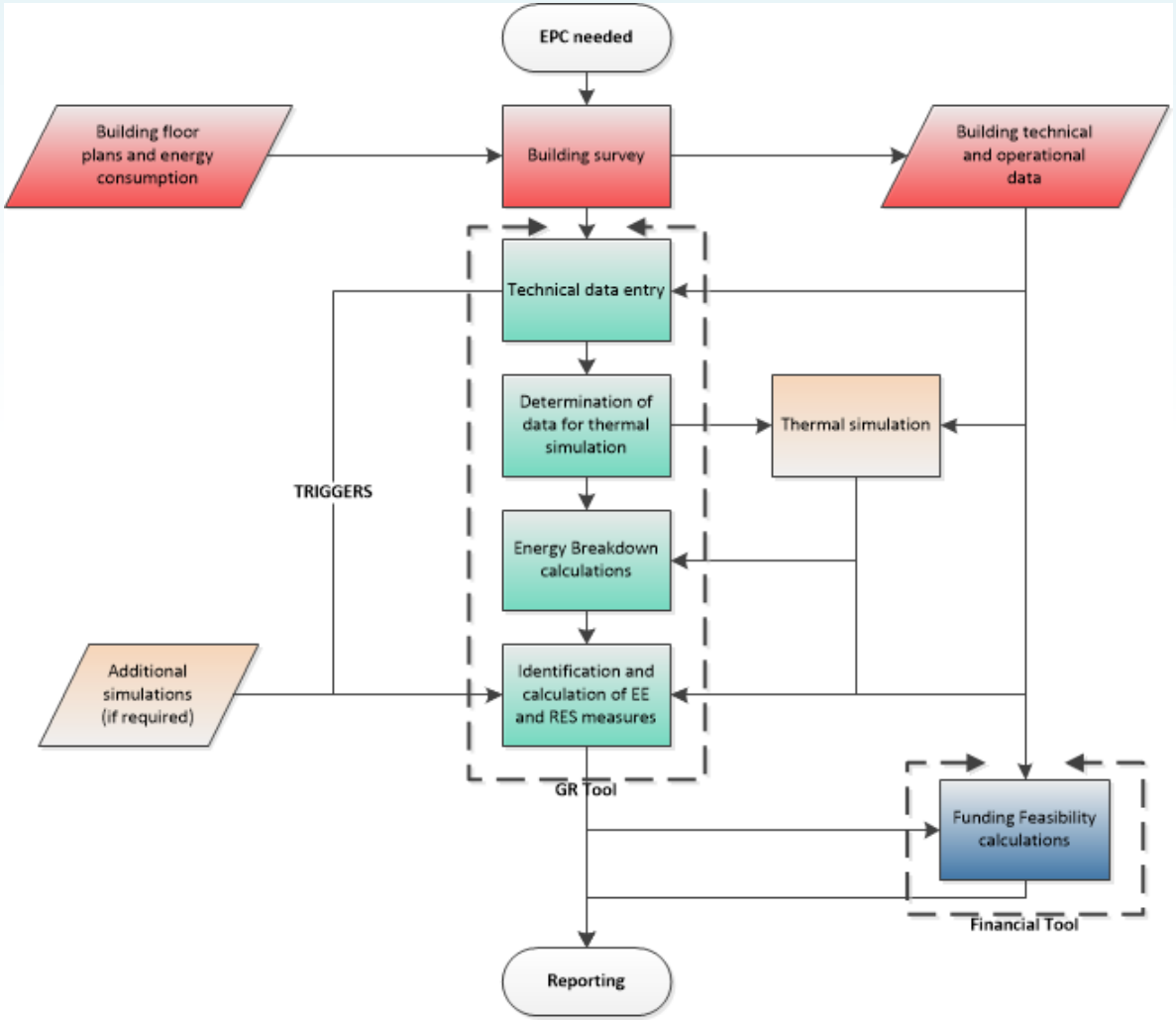
Financial savings:	**241.609**	**€/year**
Energy savings:	**1.990.560**	**kWh/year**
Energy savings percentage:	**23,62**	**%**
Carbon savings:	**682.501**	**kgCO_2/year**
Investment:	**1.234.660**	**€**
Equity percentage:	**20**	**%**
IRR:	**29,0**	**%**
NPV:	**260.727**	**€**
avg. DSCR:	**1,9**	
min. DSCR:	**1,4**	
Discounted payback:	**4**	**years**

LABEL	DESCRIPTION
A	High Profitability, low likelihood of bad performance, very robust structure, short payback time, with a high level of security in the loan
B	Medium-High Profitability, medium-low likelihood of bad performance, medium-short payback time, with a medium-high level of security in the loan
C	Medium Profitability, medium likelihood of bad performance, medium payback time, with a medium level of security in the financing
D	Medium-Low Profitability, medium-high likelihood of bad performance, medium-long payback time, with a medium-low level of security in the financing
E	Low Profitability, high likelihood of bad performance, long payback time, with a low level of security in the financing

Standardising technical approach



GREPCon – the process

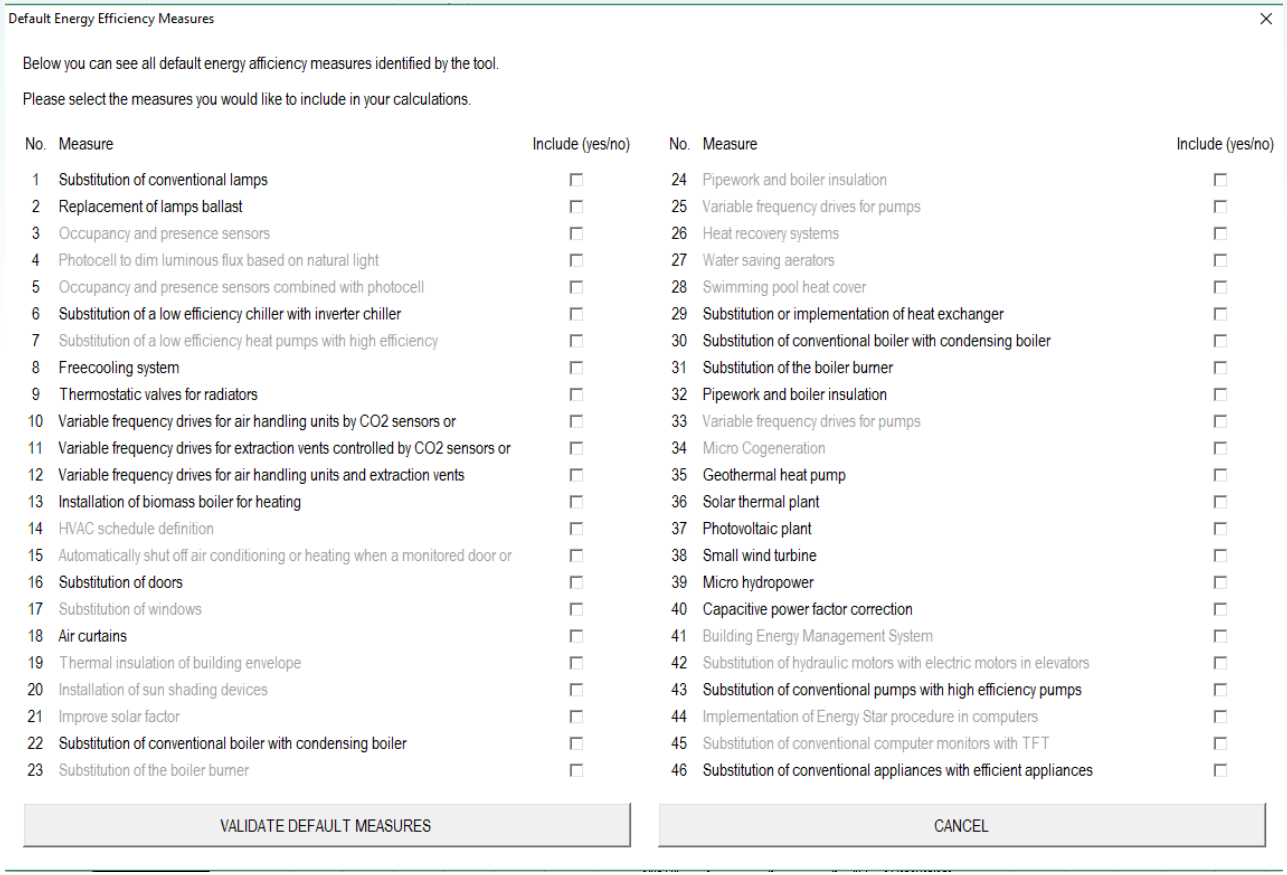


GREPCon – the process

- Each measure is identified and calculated independently:

Energy use	Measure n.°	Title	Criteria				
Lighting	1	Substitution of conventional lamps	Halogen lamps	Incandescent lamps	Fluocompact lamps	T12 Fluorescent tubes	T8 Fluorescent tubes
	2	Replacement of lamps ballast	Standard ballasts				
	3	Occupancy and presence sensors	Central switching	Local manual switching	Motion sensors to zones other than office	Daylight sensors	No controls (operation 24/7)
	4	Photocell to dim luminous flux based on natural light	Central switching	Local manual switching	Motion sensors to zones other than office	Motion sensors including office	No controls (operation 24/7)
	5	Occupancy and presence sensors combined with photocell	Central switching	Local manual switching	Motion sensors to zones other than office	Motion sensors including office	Daylight sensors
Heating, Ventilation and Air Conditioning	6	Substitution of a low efficiency chiller with inverter chiller	2.5	2.5			
	7	Substitution of a low efficiency heat pumps with high efficiency	2.5	2.5			
	8	Freecooling system	No				
	9	Thermostatic valves for radiators	No				
	10	Variable frequency drives for air handling units by CO2 sensors or occupancy sensors	No				
	11	Variable frequency drives for extraction vents controlled by CO2 sensors or occupancy sensors	No				
	12	Variable frequency drives for air handling units and extraction vents controlled by CO2 sensors or occupancy sensors	No				
	13	Installation of biomass boiler for heating	Normal boiler	Low temperature boiler	Condensation boiler	District heating network	Electricity
	14	HVAC schedule definition	No				
	15	Automatically shut off air conditioning or heating when a monitored door or window remains open for a period of time	No				
	16	Substitution of doors	NO CRITERION				
	17	Substitution of windows	2				
	18	Air curtains	NO CRITERION				
	19	Thermal insulation of building envelope	0.35				
	20	Installation of sun shading devices	None	Tinted glazing			
	21	Improve solar factor	0.6				
	22	Substitution of conventional boiler with condensing boiler	Normal boiler	Low temperature boiler			

GREPCon – the process



Default Energy Efficiency Measures

Below you can see all default energy afficiency measures identified by the tool.

Please select the measures you would like to include in your calculations.

No.	Measure	Include (yes/no)	No.	Measure	Include (yes/no)
1	Substitution of conventional lamps	☐	24	Pipework and boiler insulation	☐
2	Replacement of lamps ballast	☐	25	Variable frequency drives for pumps	☐
3	Occupancy and presence sensors	☐	26	Heat recovery systems	☐
4	Photocell to dim luminous flux based on natural light	☐	27	Water saving aerators	☐
5	Occupancy and presence sensors combined with photocell	☐	28	Swimming pool heat cover	☐
6	Substitution of a low efficiency chiller with inverter chiller	☐	29	Substitution or implementation of heat exchanger	☐
7	Substitution of a low efficiency heat pumps with high efficiency	☐	30	Substitution of conventional boiler with condensing boiler	☐
8	Freecooling system	☐	31	Substitution of the boiler burner	☐
9	Thermostatic valves for radiators	☐	32	Pipework and boiler insulation	☐
10	Variable frequency drives for air handling units by CO2 sensors or	☐	33	Variable frequency drives for pumps	☐
11	Variable frequency drives for extraction vents controlled by CO2 sensors or	☐	34	Micro Cogeneration	☐
12	Variable frequency drives for air handling units and extraction vents	☐	35	Geothermal heat pump	☐
13	Installation of biomass boiler for heating	☐	36	Solar thermal plant	☐
14	HVAC schedule definition	☐	37	Photovoltaic plant	☐
15	Automatically shut off air conditioning or heating when a monitored door or	☐	38	Small wind turbine	☐
16	Substitution of doors	☐	39	Micro hydropower	☐
17	Substitution of windows	☐	40	Capacitive power factor correction	☐
18	Air curtains	☐	41	Building Energy Management System	☐
19	Thermal insulation of building envelope	☐	42	Substitution of hydraulic motors with electric motors in elevators	☐
20	Installation of sun shading devices	☐	43	Substitution of conventional pumps with high efficiency pumps	☐
21	Improve solar factor	☐	44	Implementation of Energy Star procedure in computers	☐
22	Substitution of conventional boiler with condensing boiler	☐	45	Substitution of conventional computer monitors with TFT	☐
23	Substitution of the boiler burner	☐	46	Substitution of conventional appliances with efficient appliances	☐

VALIDATE DEFAULT MEASURES

CANCEL

GREPCon – the process (technical)

EPC RECOMMENDATION SHEET

Energy Efficiency Measure 2

Replacement of lamps ballast

Measure automatically identified?	YES
Building system link:	Lighting
Recommendation criterion type:	Lamp ballast type
Number of possible criteria:	1
Number of criteria met:	1

Measure criteria

		Criterion met?
Criterion 1:	Standard ballasts	Yes

Total system consumption:	**724,048**	kWh/year
Total sub-system(s) consumption:	**718,848**	kWh/year

GREPCon – the process (financial)

PROJECT GENERAL DATA

Project indexes

(1) Energy inflation rate	0,0%
(2) General inflation rate	1,0%
(3) Euribor (select)	2,0%
(4) Spread	2,0%
Interest rate	4,0%
(5) Loan formalisation fee	0,5%
(6) EPC Loan repayment term (years)	10
(6bis) Loan repayment term (years)	10
(7) EBT tax rate	28%

Project financial data

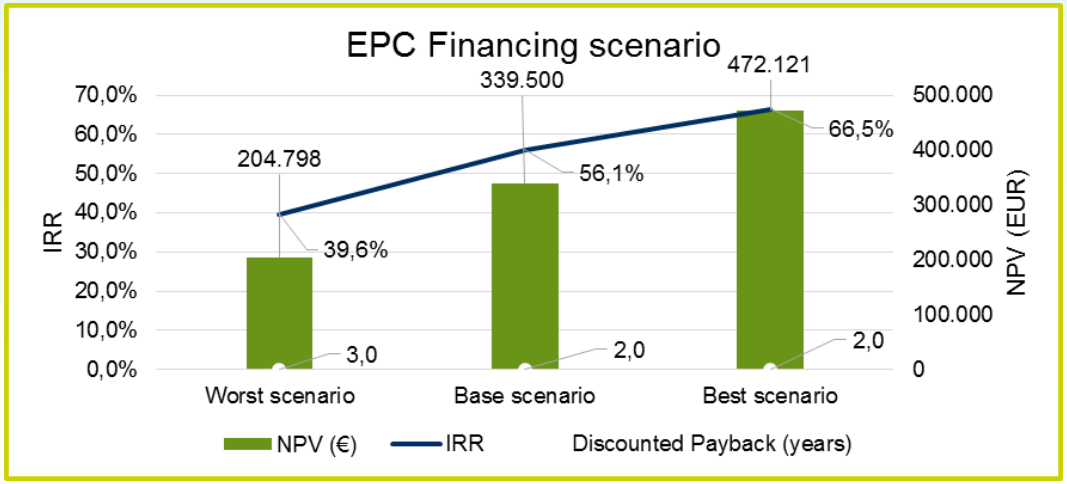
(8) Project direct investment	€ 233.738
(9) % of additional expenses	1%
(10) % of Grant (subsidies)	0%
Total investment amount	€ 236.075
(11) % debt	80%
% equity	20%
Debt	€ 188.860
Equity	€ 47.215
Grant	0
(12) K asset (required return)	9%
(13) K equity (required return)	9%
(14) % of investment subject to depreciation	100%
Investment subject to depreciation	€ 236.075
(15) Working capital requirements (% of income)	16,7%
(16) EPC Depreciation period (years)	10
(16bis) Asset Depreciation period (years)	11

PROJECT SPECIFIC DATA

RESULTS (€)

Income (Sales)	€ 38.159
(17) Energy savings	€ 28.580
(18) Energy production	€ 2.742
(19) Water savings	-
(20) Incentives	€ 6.837
Expenses	€ -
(21) Energy supply	-
(22) O&M	-
(23) Overhead	1,0%
(24) Client shared savings (%):	0,0%
(25) EPC Project duration (years)	10
(25bis) ESM Project Horizon (years)	20

GREPCon – the process (financial)



	Best	Base	Worst
Income - energy and water savings	+	=	-
Income - energy production	+	=	-
Investment overcost	N/A	=	+
O&M overcost	N/A	=	+
Energy inflation rate	+	=	-
General inflation rate	+	=	-
Interest rate	-	=	+

TRUST EPC SOUTH

www.trustepc.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649772

Thank you for your attention

Contact: Jakub Bartnicki

email: jakub.bartnicki@uk.bureauveritas.com

Contact: Paolo Michele Sonvilla

email: pms@creara.es

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649772

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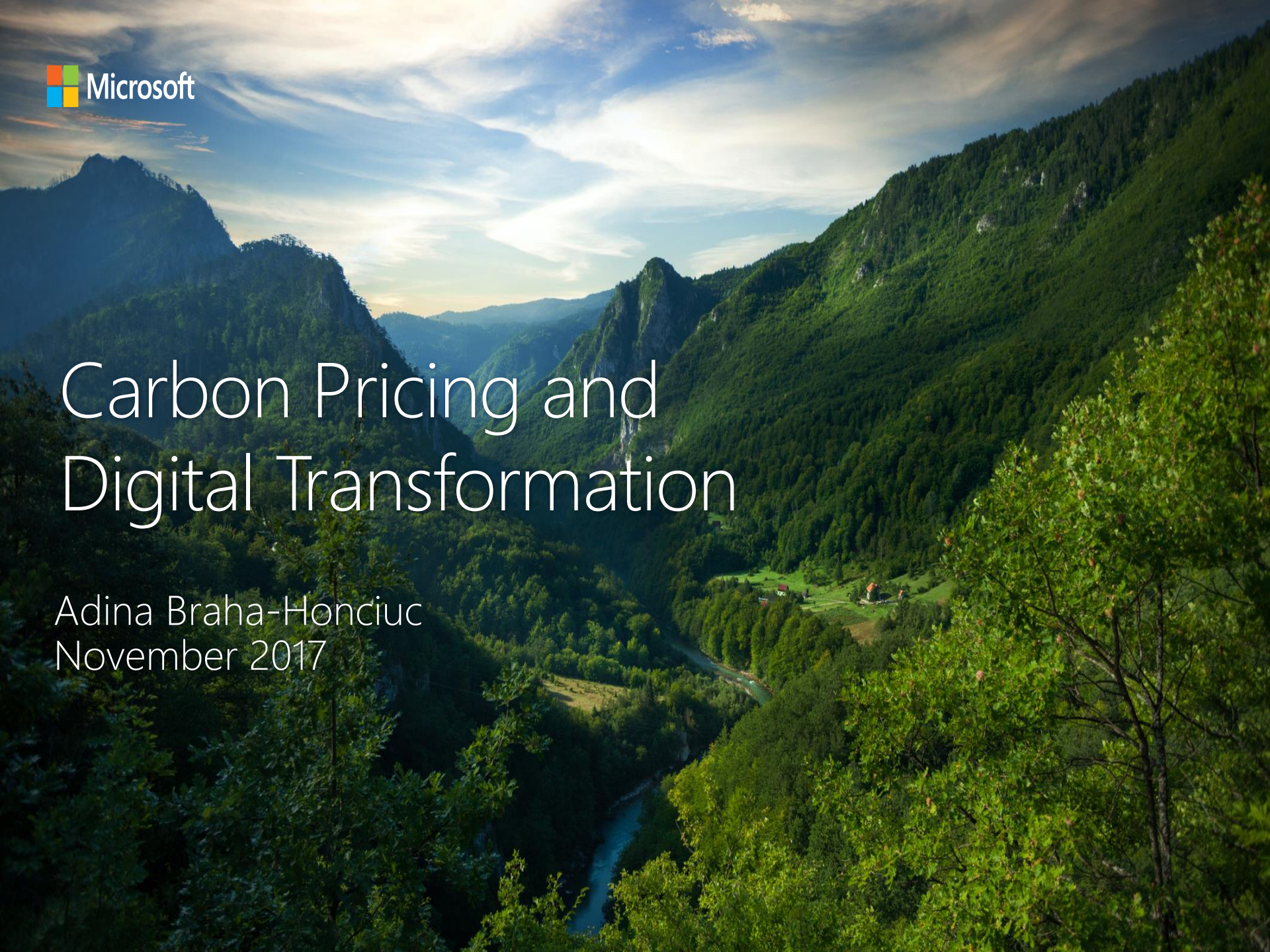
European Framework Initiative for Energy & Environmental Efficiency in the ICT Sector

Carbon Pricing and Digital Transformation

Adina Braha-Honciuc
Government Affairs Manager – EU Policy

Tuesday, 27th June 2017

Microsoft



Carbon Pricing and Digital Transformation

Adina Braha-Honciuc
November 2017

Microsoft

Empower every person and every organization on the planet to thrive in a resource-constrained world.

Microsoft

Energy

OPERATIONAL GOAL

Use 50% wind, hydro and solar by 2018, 60% early next decade and improve from there

SOCIETAL GOAL

Help green the grid and accelerate the transition to a zero-carbon energy future

Microsoft

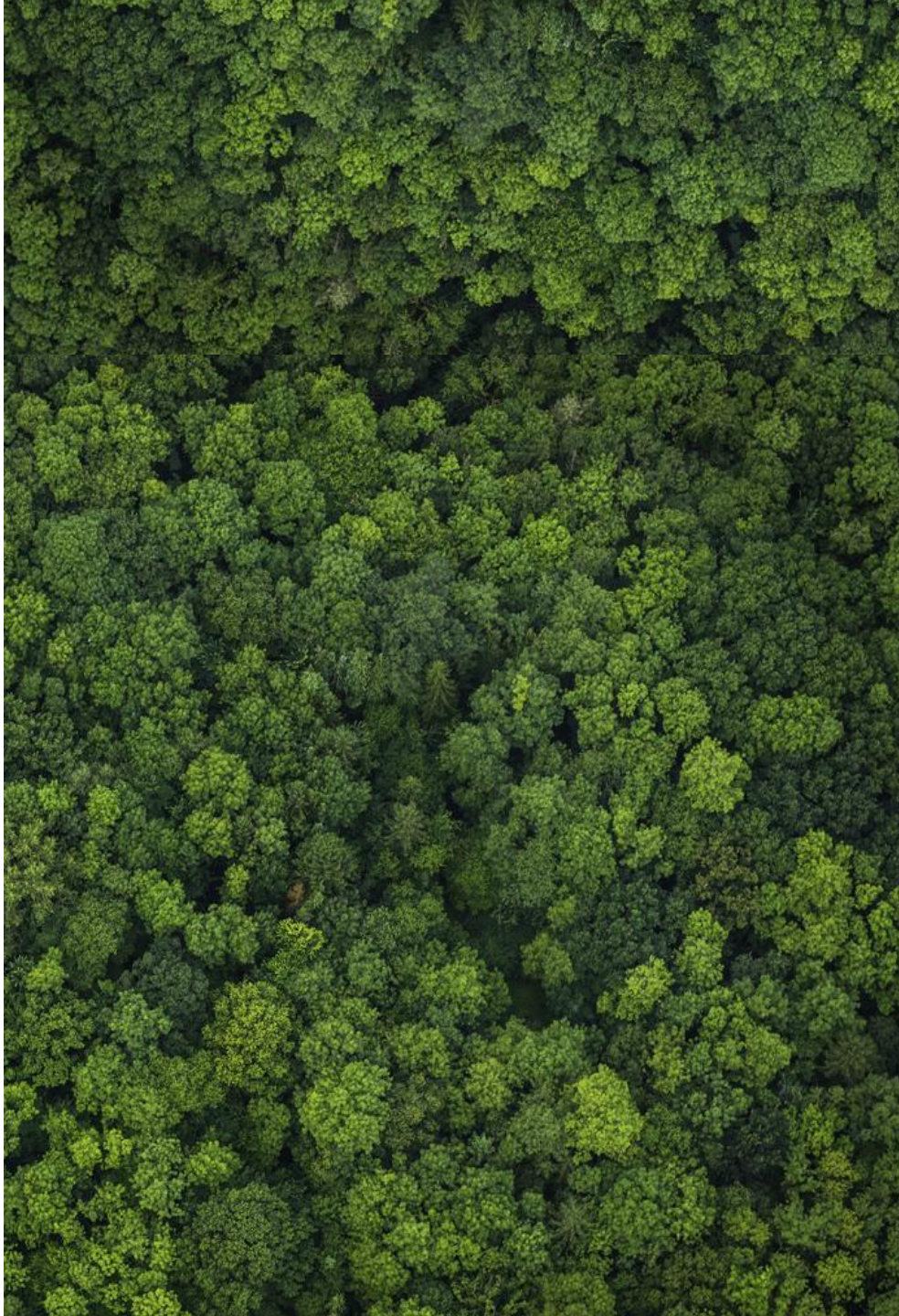
Carbon Commitments

OPERATIONAL GOAL

Reduce carbon emissions 75% by 2030 relative to 2013 base year

SOCIETAL GOAL

Enable the measurement and management of global carbon and climate change impacts



Microsoft

Carbon Fee Mechanics

Track carbon emissions from operation of our datacenters, labs, offices, manufacturing sites, and business air travel

Charge business groups a carbon neutral fee for their portion of emissions

Invest in renewable energy, carbon offsets, sustainability grants, and emissions tracking/reporting

Microsoft

Operational Results

Carbon neutrality: 9 million tons of carbon equivalent reduced

100% renewable energy: 14 billion KWh of green power

Digital Transformation for Sustainability

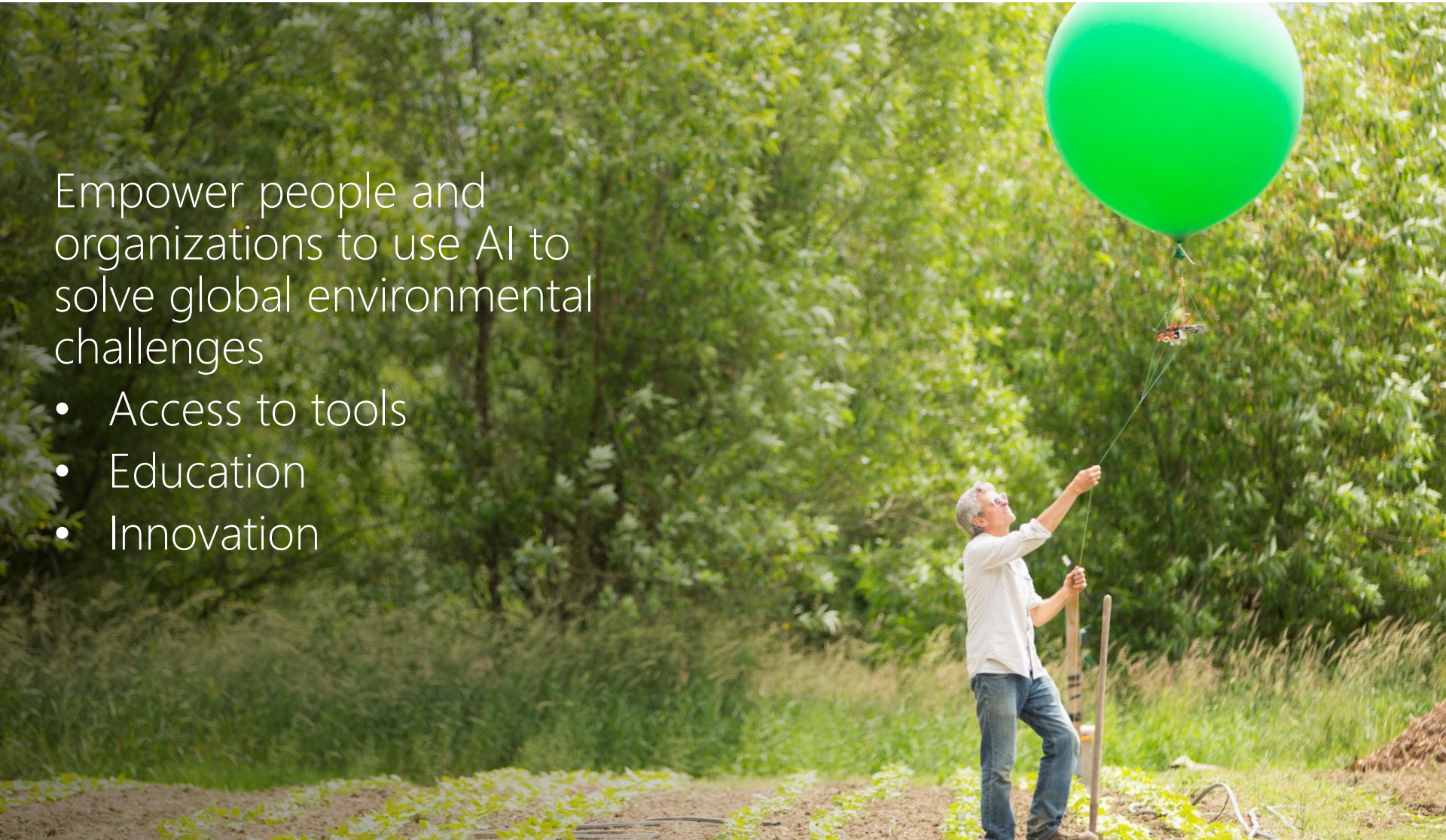
Energy: Off-grid clean energy access, Agder Energi distributed energy resource optimization

Carbon: WattTime real-time carbon emissions platform

Water: Ecolab Water Risk Monetizer

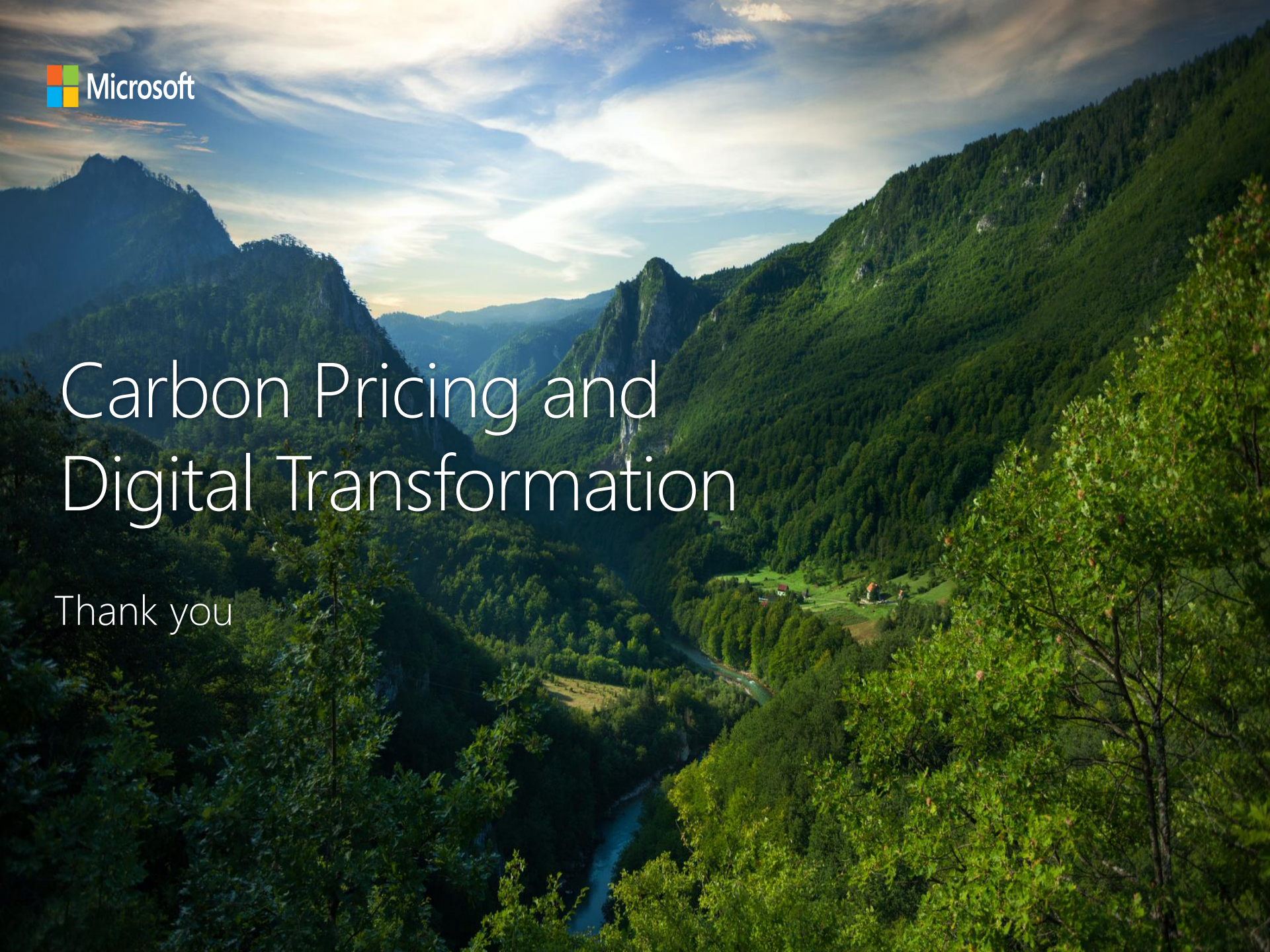
Biodiversity and Agriculture: Land cover mapping, Project Premonition, FarmBeats

AI for Earth



Empower people and organizations to use AI to solve global environmental challenges

- Access to tools
- Education
- Innovation


Microsoft
Carbon Pricing and Digital Transformation
Thank you

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

Can Formula 1 Data Center Designs green the sector for everyone with ROI benefits…

Derek Webster
CEO - Data Center Consultancy Andget

Tuesday, 21st November 2017

Andget

Data Centers to consume 3X more energy in next 10 years…

- 416 Terawatt hours: World electricity used by data centres in 2015. More than UK's total electricity consumption.
- Data centres: Repositories for billions of gigabytes of data and make the Internet and Telecoms Work.
- 3% Global electricity and about 2% greenhouse gas emissions.
- Internet penetration: best GDP impact & ROI of any infrastructure spend (outside of Water in developing nations)

Nearly Zero Energy Consumption

How to reduce energy consumption to minimize their environmental impact

Derek Webster
Board Member

DATA CENTRES

21st June 2017
Charlemagne building
Rue de la Loi 170. **BRUSSELS**

EUROPEAN DATA CENTRE ASSOCIATION

SUSTAINABLE ENERGY WEEK

An initiative of the European Commission

A Data Centre
'Efficiently Supporting Digital Work Loads'

IoT
Big Data
Storage
Apps
Telecoms
Social Media
Mobile
Shopping
Cloud …

100kW **Data Centre** power can* support 1MW of Digital Workload = 9.1% of the total power need *

50 Watt **Server** utilization of 10% (typical dedicated) = 5% efficiency (15 Watts of work = 300 Watts DC power) *

Reduce Data Centers energy consumption to minimize environmental impact

Power Generation

- Green Source & capacity
- Sustainable Mix & Grid
- RE-USE of Energy option

Data Centre Location

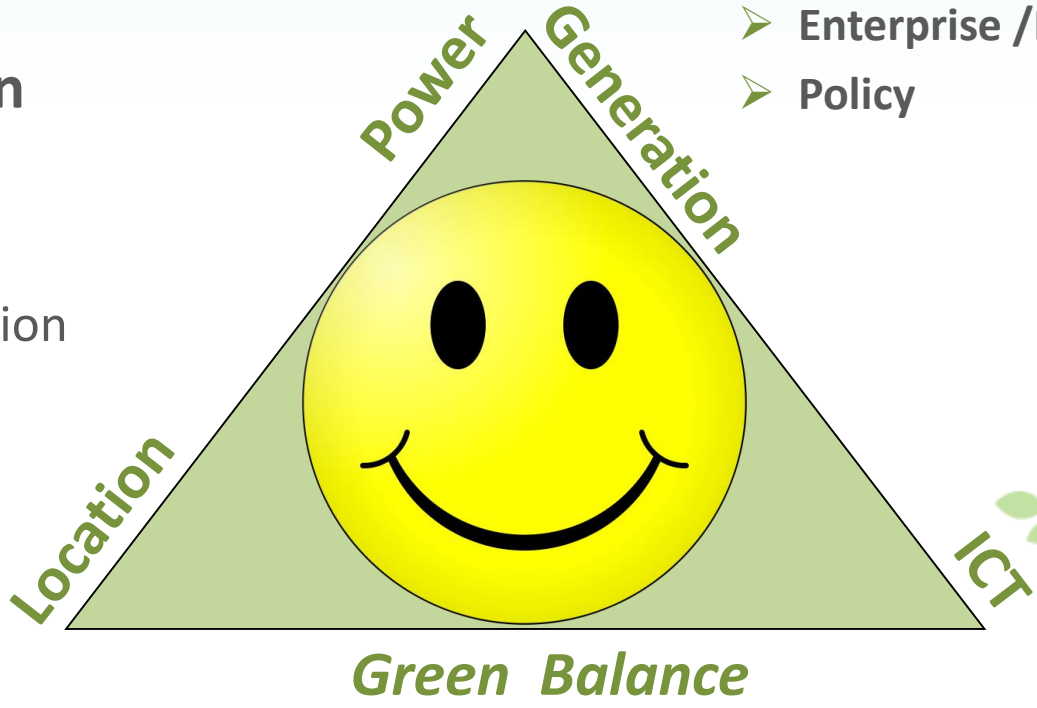
- Climate
- Infrastructure
- RE-USE of Energy option

ICT Hardware

- Utilization
- Efficiency
- Automation

'Business Case'

- **Investors**
- **Operators**
- **Enterprise /Market**
- **Policy**



2009 Data Centre now a Proven Project with wider thinking …

- Less carbon cost by keeping existing building
- Roman remains – work with Archaeologist
- Rain Water capture for cooling
- High Efficiency Design PUE 1.1 
- District Heating usage
- 95% Hydro power – option to pay tariff for 100% green energy. 

We wanted to Build This … in Europe

Bought this … Instead

…and Built this

e.g.
Keep as much as you can …
I put a roof on the roof to keep the roof
= saves CO_2 foot print and $

In a small town called Avanches:

Roman Town with Roman Remains

Our Romans

Conserve the view and the Flowers

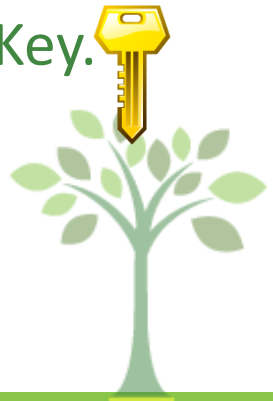
View point from previous Château slide.
"We did not want to make the view even more industrial"

Nearly Zero Energy Consumption

How to reduce Data Center energy consumption to minimize their environmental impact

The Data Centre Industry knows how to build efficient buildings.

Improvements to ICT Hardware, Site location, Enterprise using outsourced Scale providers and designs thinking wider are Key.



Thank you for your attention

Thank you	Mulțumesc
Merci	Tack
Danke	Takk
Gracias	Tak
Děkuji	Kiitos
Dank je	Благодаря
Ευχαριστώ	Hvala ti
Obrigado	Ačiū
Grazie	Paldies
Dziękuję Ci	Hvala vam
Ďakujem	Diolch”

Andget Limited

Derek Webster
CEO

71-75 Shelton Street
Covent Garden
London
WC2H 9JQ

d.webster @andget.co.uk
+ 44 7739 849621

THANK YOU!

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