

CONSTRUCTION, INFRASTRUCTURE SECURITY & ENERGY INNOVATIONS IN ICT RELATED PROJECTS

WEBINAR

17th March 2023





Welcome

Stephan Corvers
CEO & Founder

Corvers Procurement Services BV



Introduction & Agenda



House rules

It is possible to ask questions in the private chat



The recording of the webinar will be made available on the EAFIP website

The list of participants will not be disseminated



In case there are technical problems, the session will be recorded and published

AGENDA

| DAY 2 - 17 th March 12:45 to 14:45 CET (online) Construction, Infrastructure Security & Energy Innovations in ICT Related Projects | | |
|--|--|---|
| TIME (CET) | TOPIC | SPEAKER/PARTICIPANTS |
| 12:40 – 12:45 | Registration to the platform | Participants can ensure that the platform's functionalities are working fine |
| 12:45 – 12:50 | Welcome & Introduction House rules Agenda | Stephan Corvers CEO – Corvers Lieve Bos EC Policy Officer - DG Connect |
| 12:50 – 13:15 | Pre-Commercial Procurement <i>of efficient construction and energy breakthrough innovative technologies</i> | Katarzyna Lenart National Center for Research and Development, Poland |
| 13:15 – 13:45 | Sustainable Reconstruction of the Motorway A6, <i>developing calculation tools and monetizing sustainability improvements in the procurement</i> | Jeroen van Alphen Rijkswaterstaat, The Netherlands |
| 13:45 – 14:15 | ProcuRE joint-cross border Pre-Commercial <i>Procurement of breakthrough solutions for 100% renewable energy supply in buildings</i> | Georg Vogt Empirica, Germany |
| 14:15 – 14:30 | Verdygo design and construction technique <i>that leads to a modular, sustainable sewage treatment plant with an above ground setup and a simple plug & play system</i> | Corporate video Waterschapsbedrijf Limburg, The Netherlands |
| 14:30 – 14:40 | Q&A | |
| 14:40– 14:45 | Conclusions & closure | Stephan Corvers & Beatriz Gómez Fariñas |



Pre-Commercial Procurement

*of efficient construction and energy breakthrough
innovative technologies*

Katarzyna Lenart
National Center for Research and Development
Poland

Pre-Commercial Procurement of efficient construction and energy breakthrough innovative technologies

EAFIP WORKSHOP - WEBINAR

17/03/2023 r.



NCBR 

Narodowe Centrum Badań i Rozwoju

Barriers into challenges

Pull innovations as Green Deal transformation tool: the purpose and scope of the projects are specified by the NCRD.

Green Deal transformation technologies should be:

- as final as possible,
- cheaper than traditional ones,
- possible to implement in domestic market.

3xWin Principle for the scope of PCP projects:



- for environment – cleaner,
- for people – healthier and cheaper,
- for economy and business – more and local.



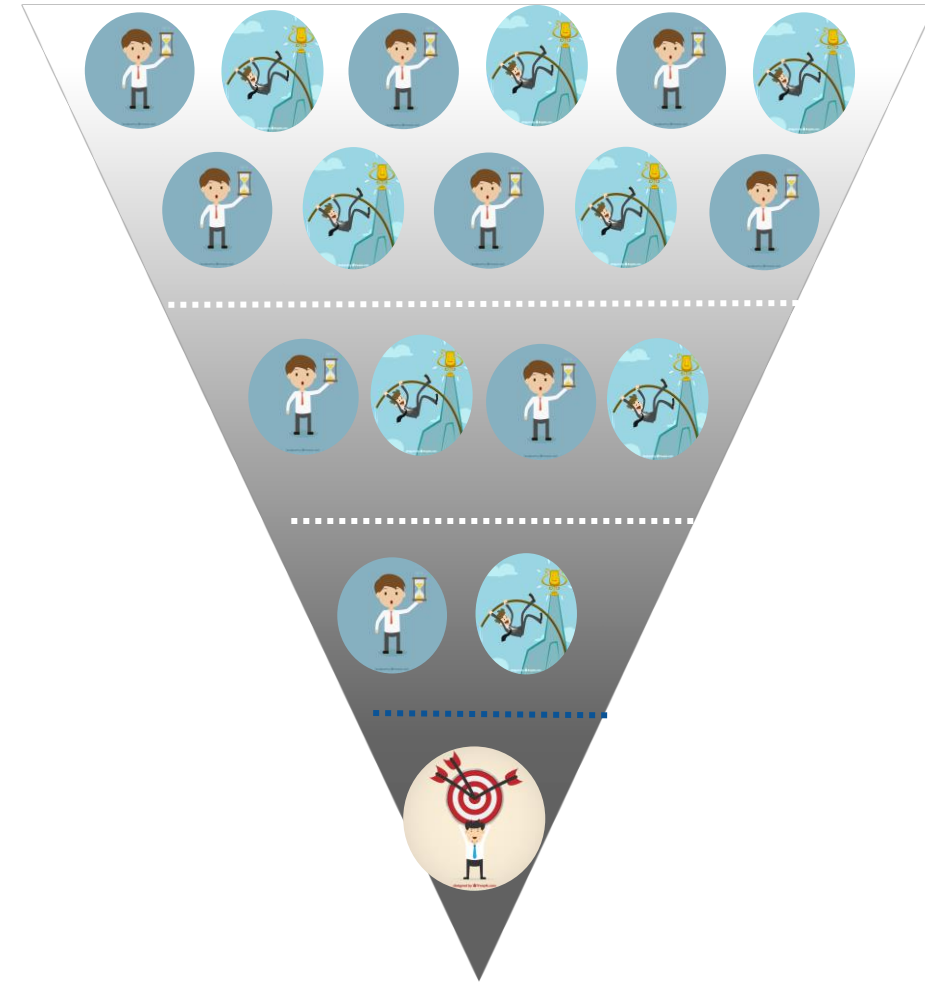
Green Deal PCP projects

Green Deal transformation tool: the purpose and scope of the projects are specified by the NCRD

Competition of contractors and selection in subsequent stages – a guarantee of the effect

Growing level of financing during the project – effective spending of public funds

Selection of contractors based on the measurable parameters – effectiveness, process transparency, no complaints



Green Deal PCP projects

Reduction of formal requirements – selection of the best technological projects

Technology and process innovations – the effects count

Full-scale demonstrators – the final confirmation of the technology

Technology benchmarking and promotion of good practices – effective stimulation of whole sectors of the market



Green Deal PCP projects

Technology benchmarking and promotion of good practices – effective stimulation of whole sectors of the market

Technology licensing – wide distribution of solutions

Continuation of technology development (implementation of market support) by other institutions – technology deployment guaranteed



Green Deal PCP projects

| Project | Contracts | Number of Demonstrators | R&D Budget [mln PLN] |
|--|-----------|-------------------------|----------------------|
| Innovative biomethane plant | 3 | 1 | 49,5 |
| Sewage treatment plant of the future | 3 | 1 | 33,8 |
| Process and energy efficient building construction | 9 | 3 | 54,0 |
| Heating plant of the future | 7 | 1 | 52,8 |
| Combined heat and power plant in the local energy system | 10 | 1 | 59,0 |
| HVAC for schools and houses | 7 | 4 | 11,9 |
| Micro-retention systems | 4 | 4 | 9,6 |
| Electric power storage | 5 | 2 | 14,5 |
| Heat and cold storage | 9 | 5 | 15,9 |
| Total: | 57 | 22 | 301,1 |

Process and energy efficient building construction

green building can be cheaper than a conventional one



Process and energy efficient building construction

- **Modularity and prefabrication:** quality standardisation, short construction time, finished interiors, low price,
- **Green Deal:** positive energy balance, BMS system, zero emissions, closed cycle rainwater, recycled materials, low carbon footprint, adaptation to climate change
- **Dedicated building solutions:** adaptation to the needs of residents: Social Housing, Senior Housing, Single-family Housing



14

Process and energy efficient building construction

The aim of the project:

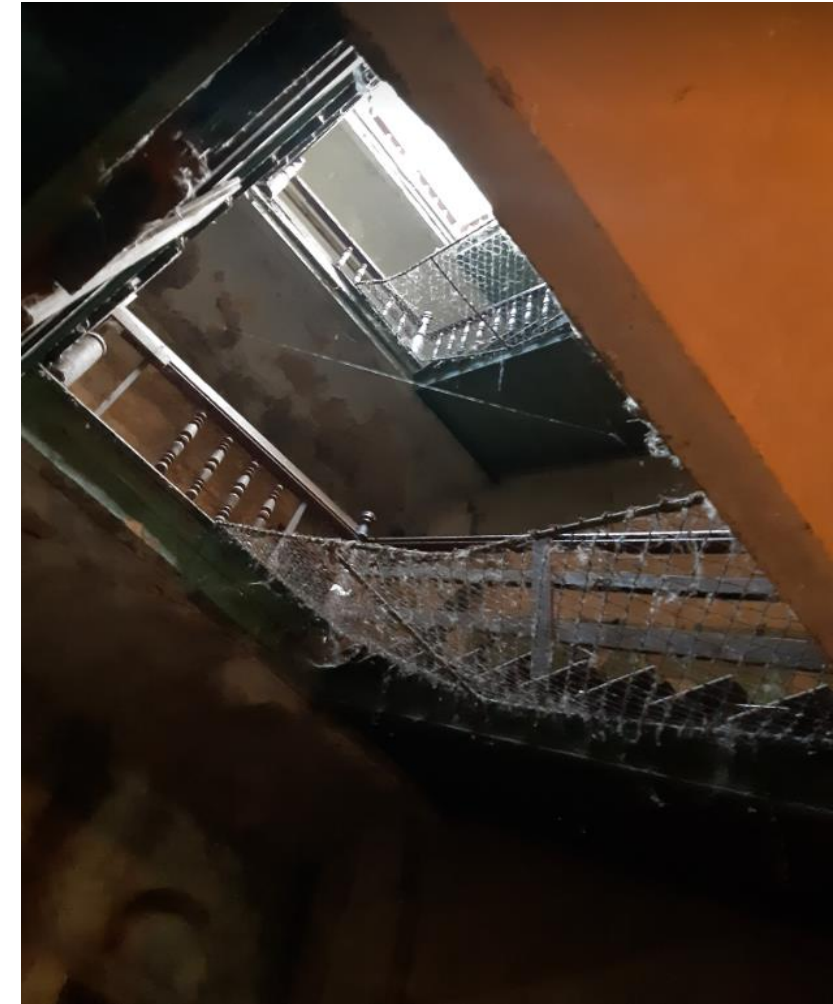
Breaking down all barriers to construction in terms of:

- Building methods,
- Climate protection and ecology,
- Demography challenges,
- Real housing needs.



Process and energy efficient building construction

The current state of social housing in Mysłowice



Process and energy efficient building construction

R&D Budget: **54,0 mln PLN**

Number of contractors: 9

Parts of the project:
Social, Senior and Single-Family Housing



Źródło: Flaticon, Eucalypt

Mandatory requirements of the project:

- Prefabrication/modularity;
- Short construction time, energy efficiency;
- Scalability of solutions, turnkey finished interiors;
- BMS system;
- Tailored to the needs of seniors (day care centre, greenhouse, doctor's surgery, adaptation of flats for wheelchair access);
- Requirements defining the framework of the competition such as: number of flats, dimensions, standard of finish, surroundings of the building.

What Contractors Compete With:

- Lowest turnkey construction costs;
- Lowest operating costs for 30 years;
- Lowest energy consumption;
- Best energy balance;
- Highest level of recycling of building materials;
- Lowest carbon footprint of building materials;
- Quality of Demonstrators' architectural solutions.

Strategic partners

- Municipalities that have made land available for the construction of Technology Demonstrators: Mysłówice, Rumia, Włocławek.

Process and energy efficient building construction

Costs of constructing buildings using the traditional method:

The average price of 1 m² of the total area of the building equipped in developer standard is approximately **PLN 6,000.00 gross**. Average price of 1 m² of total area based on selected tender proceedings for multi-family buildings in 2022.

The average price of 1 m² of the total area of the building equipped 'turnkey' without the cost of landscaping is approximately **PLN 7,500.00 gross**.

The cost of fit-out has been assumed at PLN 1,500.00 gross per 1 m² of total area.



Process and energy efficient building construction

Phase I effects



Process and energy efficient building construction

Phase II results - locations where technology demonstrators will be built:
Single-family, Senior and Social building.



Process and energy efficient building construction

Technology demonstrators: Social Building, Senior Building and Single-Family Building.



Process and energy efficient building construction

Phase II effects – technology demonstrator of Social Building



<https://www.youtube.com/watch?v=e4B77bOQFDk>

Innovative biomethane plant

the biogas plant can stably produce biomethane from a wide range of waste materials without causing a nuisance to the environment



Innovative biomethane plant

Key challenges:

- Management of waste from agriculture and the agri-food industry
- Possibility to use various substrates from the agri-food industry in the technological process
- Stable production of biomethane of natural gas/bioCNG/bioLNG quality
- Lack of odours throughout the entire process
- Energy self-sufficiency
- Closure of the biogenic cycle in nature, "zero waste" -> closed loop economy

Strategic partner:

Poznan University of Life Sciences
Brody Experimental Station



Innovative biomethane plant

R&D Budget: **49,5 mln PLN**

Number of contractors: 3



źródło: Flaticon, Eucalypt

What Contractors Compete With:

- Methane production capacity
- Biomethane production capacity
- Phase I and Phase II development costs
- Commercialisation revenue
- Quality and optional requirements

Mandatory requirements:

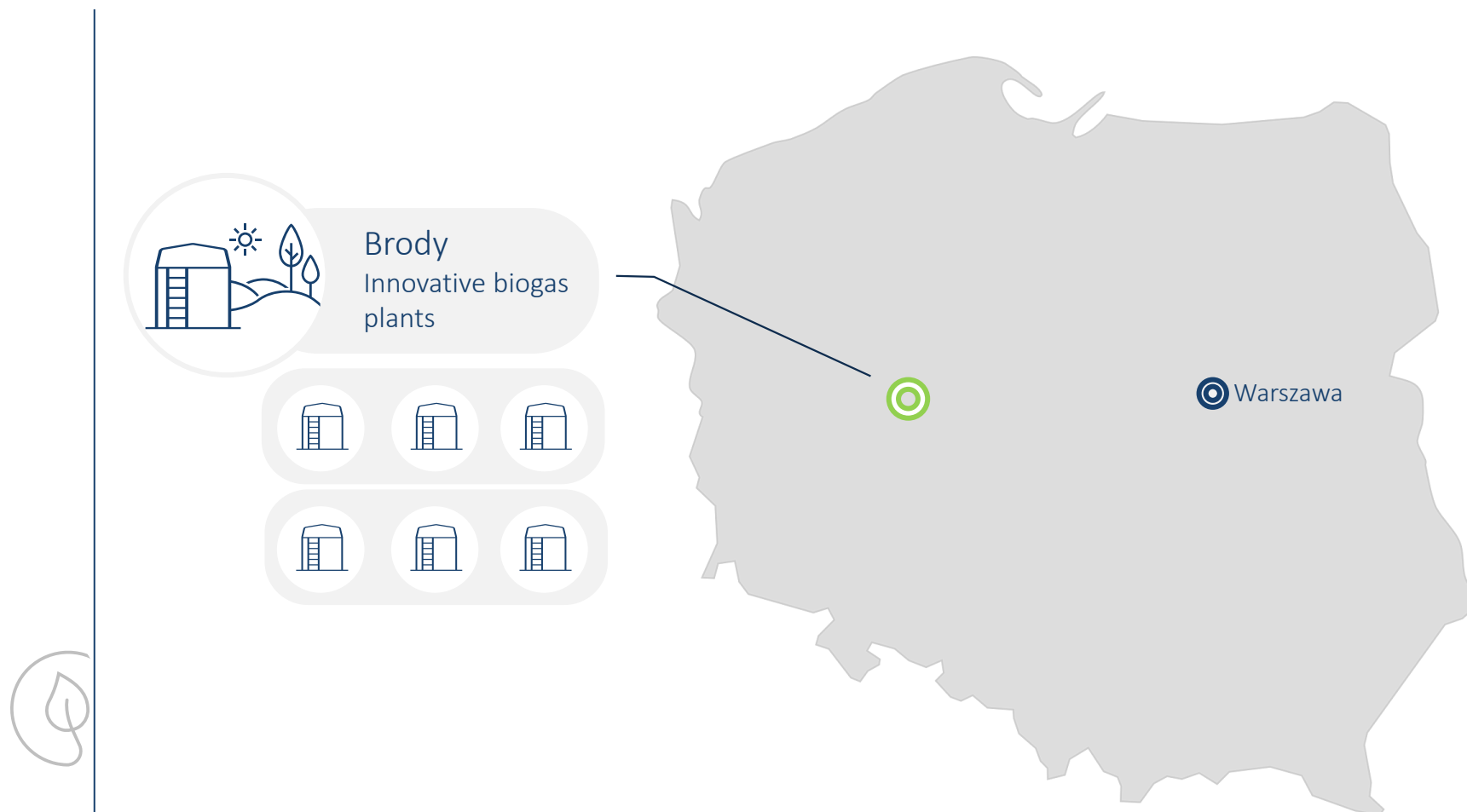
- Substrate versatility of the technology;
- Odourless technology;
- Biomethane production;
- Installation with a capacity equivalent to 499kW;
- Bio-fertiliser production.

Strategic Partner: Poznan University of Life Sciences

- Provides real estate for the construction of Micro-Installations and Technology Demonstrator, implementation of associated infrastructure, utilities and laboratory analyses of substrates and digestate from Micro-Installations;
- Responsible for conducting Micro-Installations Tests, built at the Experimental Station in Brody and Technology Demonstrator Tests.

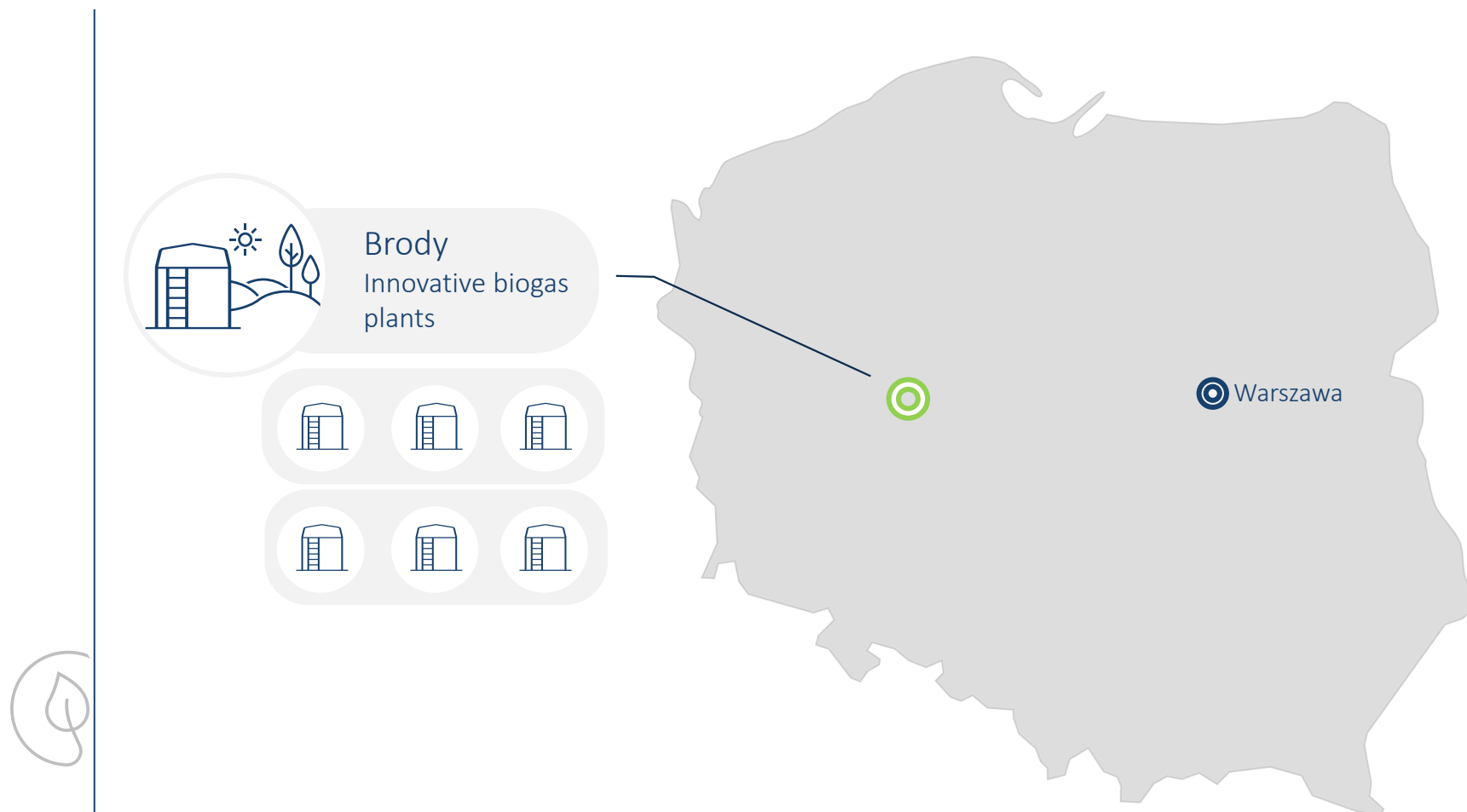
Innovative biomethane plant

Results of R&D phases - location of six micro-installations (phase I), and one full-scale biogas plant (phase II)



Innovative biomethane plant

Results of R&D phases - location of six micro-installations (phase I), and one full-scale biogas plant (phase II)



Innovative biomethane plant


Construction of Micro-Installations in Brody





NAGRODA
Magazynu Biomasa
oraz magazynbiomasa.pl

w kategorii
PROJEKT BIOGAZOWY
dla
**Narodowego Centrum
Badań i Rozwoju**

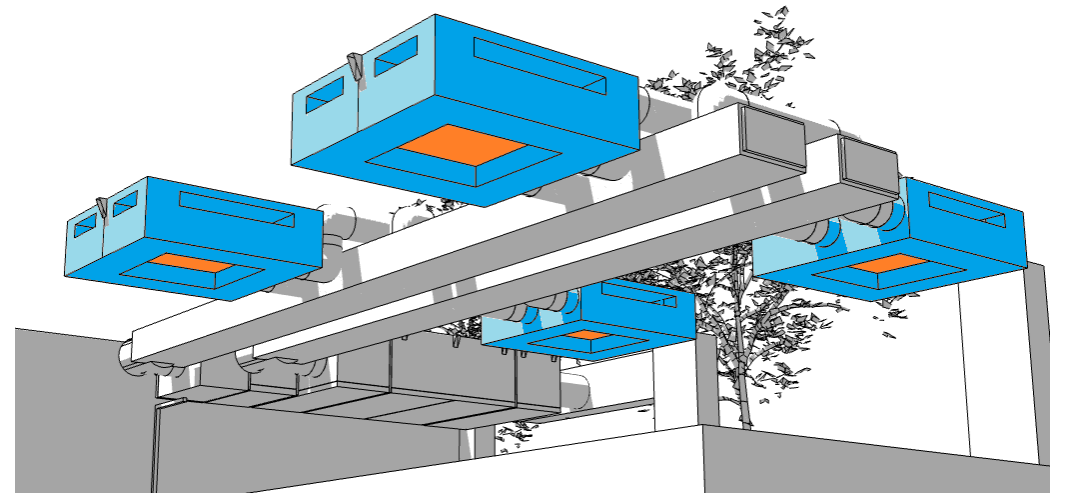


VI Kongres Biogazu i Biometanu
CKS OSSA
13-14.12.2021 r.



HVAC for schools and houses

ventilation can be installed in existing (old) buildings, resulting in clean and fresh air without loss of energy



HVAC for schools and houses

Kluczowe wyzwania projektu:

- Development of distributed ventilation/recuperation systems ensuring: no heat loss, appropriate CO2 and humidity levels, highly efficient air filtration eliminating contaminants such as: particulate matter, organic compounds, viruses and bacteria
- Indispensable for schools (too high CO2 levels)
- Indispensable for multi-family houses (heat loss = increased heating costs)

Missing element in the process of thermal modernisation of buildings



HVAC for schools and houses

R&D Budget: 11,9 mln PLN

Number of Contractors:
Part 1. 4 Contractors
Part 2. 3 Contractors

Parts of the project: 2
Part 1. HVAC for classrooms
Part 2. HVAC for apartments



Źródło: Flaticon, Eucaalyp

Mandatory requirements

- defining a classroom/apartment;
- number of persons;
- occupancy schedule;
- outdoor and indoor air pollution;
- parameters of the test environment;
- floor plan of the room with measuring points.

What contractors compete with:

- Environmental air quality;
- Microbiological air quality;
- Ventilation efficiency;
- Heat and cooling recovery;
- Supply air humidity;
- Electricity consumption;
- Sound level;
- Draught risk;
- Total costs.

Testing Partner:

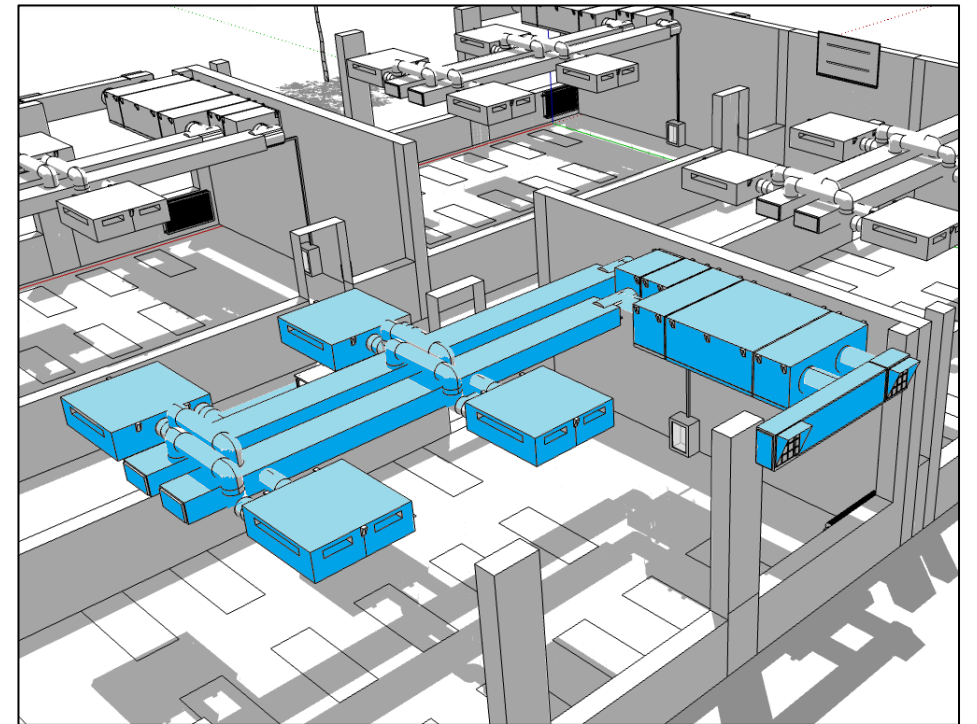
- Politechnika Śląska

HVAC for schools and houses

Part 1.

HVAC for Classrooms

Technology tests are underway - results coming soon!

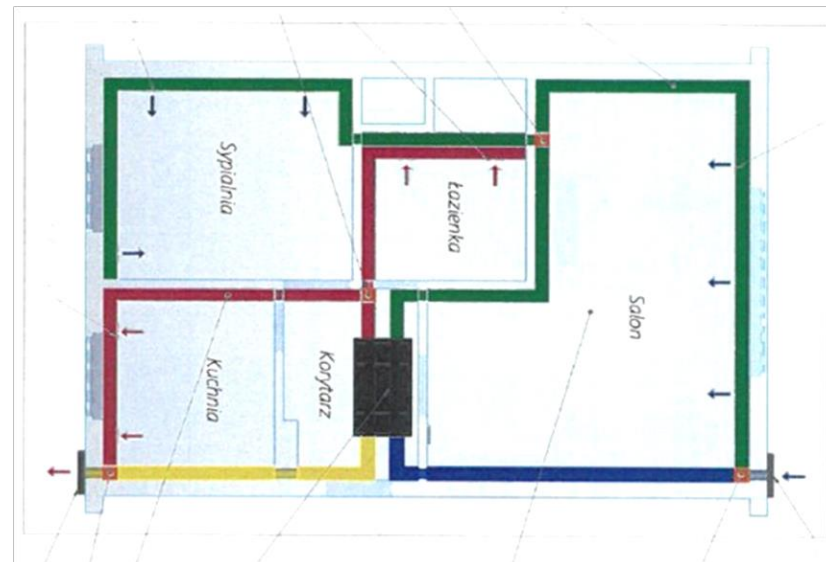


HVAC for schools and houses

Part 2.

HVAC for apartments

Technology tests are underway - results coming soon!





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Thank you!

Sustainable Reconstruction of the Motorway A6

*developing calculation tools and monetizing sustainability
improvements in the procurement*

Jeroen van Alphen
Rijkswaterstaat
The Netherlands



The use of:

- Functional Specification
- Best Price Quality Ratio
 - DuboCalc
- Environmental Cost Indicator
 - The A6 Almere
 - And future steps

Incorporating sustainability into Infrastructure projects The NL national perspective



Jeroen van Alphen

Project leader SPP-criteria www.sppcriteria.co

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SPP does not start with a “P”

- Refuse, Reduce etc.
- Functional Specifications
- Monetizing of environmental impacts
- B.P.Q.R.



Functional specifications

1. Want vs Need

2. Functional specifications

- No specific technical solutions demanded!!
- Conditions

3. All decisions based on:

- Lifecycle Costing;
- Total cost of Ownership.

4. D&C and DBFM(O) contracts

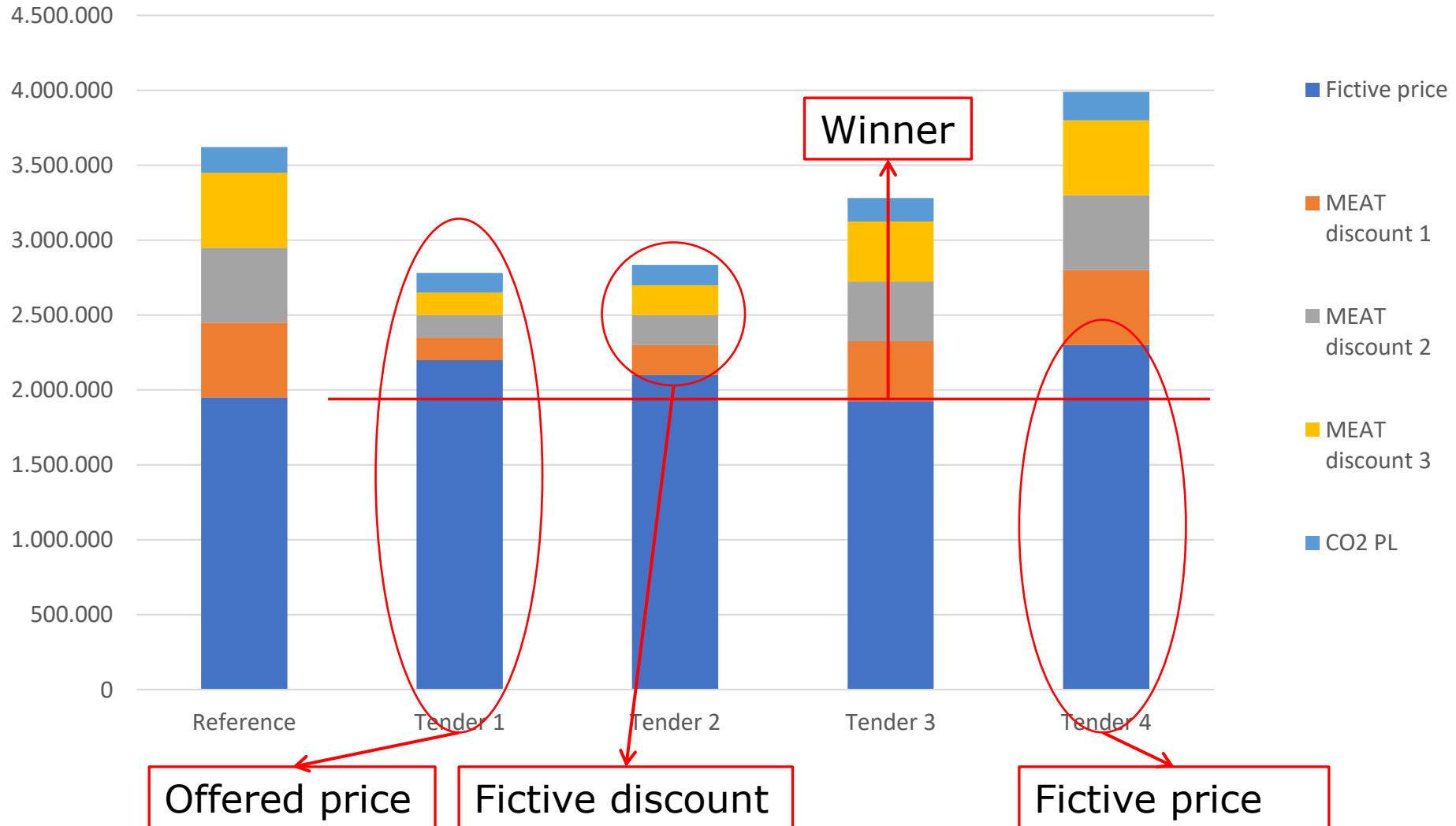


Best Price Quality Ratio (BPQR)/ Most Economically Advantageous Tender (MEAT)

- Selection of tenders based on a combination of price and quality
- Quality includes for instance:
 - Public oriented approach ('less hindrance')
 - Risk management
 - Sustainability
- The criteria must:
 - Create competition between tenderers
 - Be easy to understand for tenderers
 - Show differences in quality
- Two instruments
 - CO₂ performance ladder and DuboCalc



BPQR/ MEAT calculation



How do we calculate fictive discount?

Du = Duurzaam = Sustainable
Bo = Bouwen = Construction
Calc = Calculator



“A software tool
to measure sustainability of a project(design)
in an objective and standardized manner,
to be used as awarding criterion
in a procurement process”

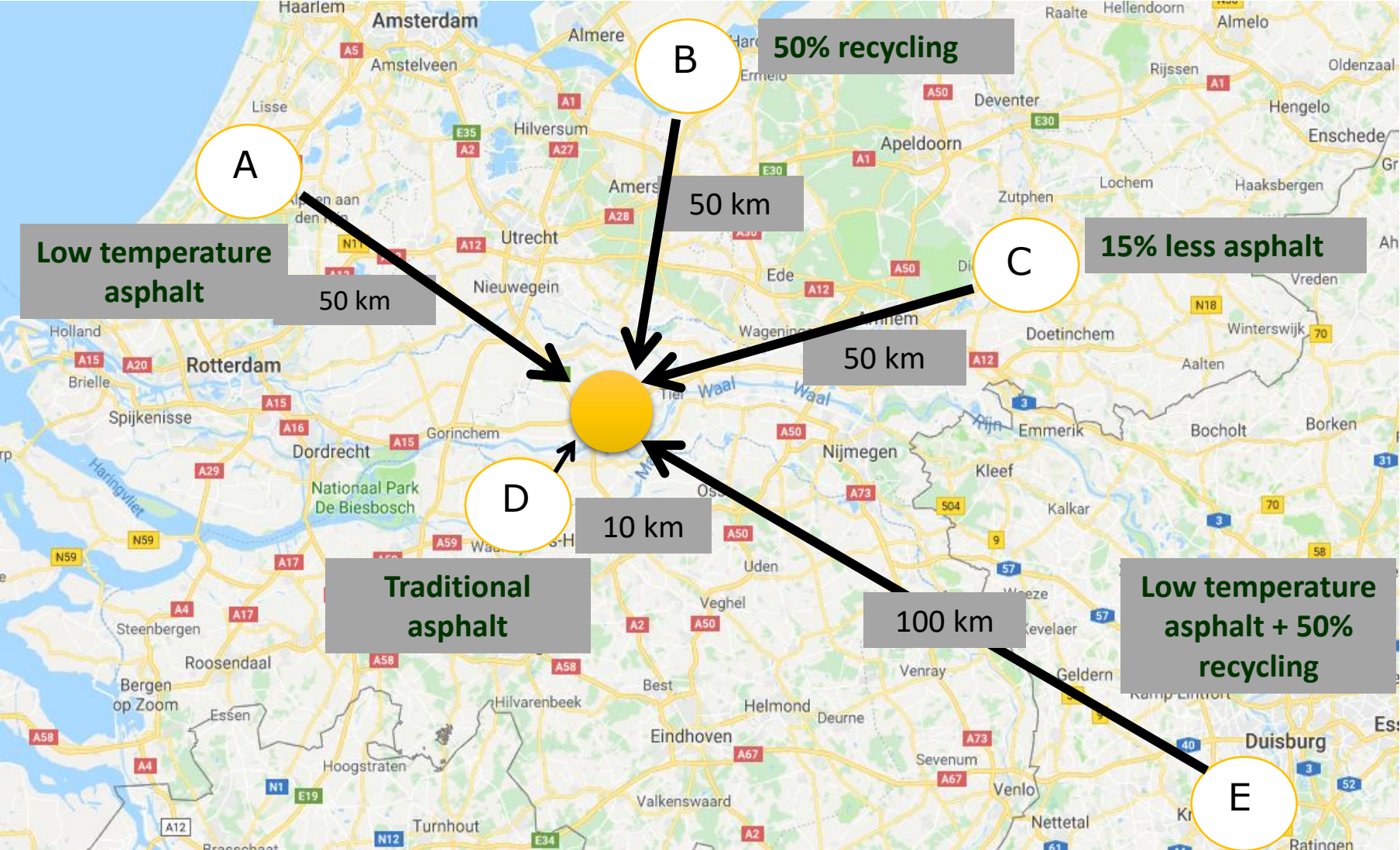


About DuboCalc

- DuboCalc calculates the environmental impacts of the different infrastructure designs, based on material and energy use during the whole lifecycle, this is called the Environmental Cost Indicator (ECI)
- DuboCalc uses the method of the environmental Life Cycle Analysis (LCA)
- Objective comparison of tender-bids
- RWS will use this LCA-instrument by judging the environmental impact of the bids (award criterion) (BPQR/ MEAT)

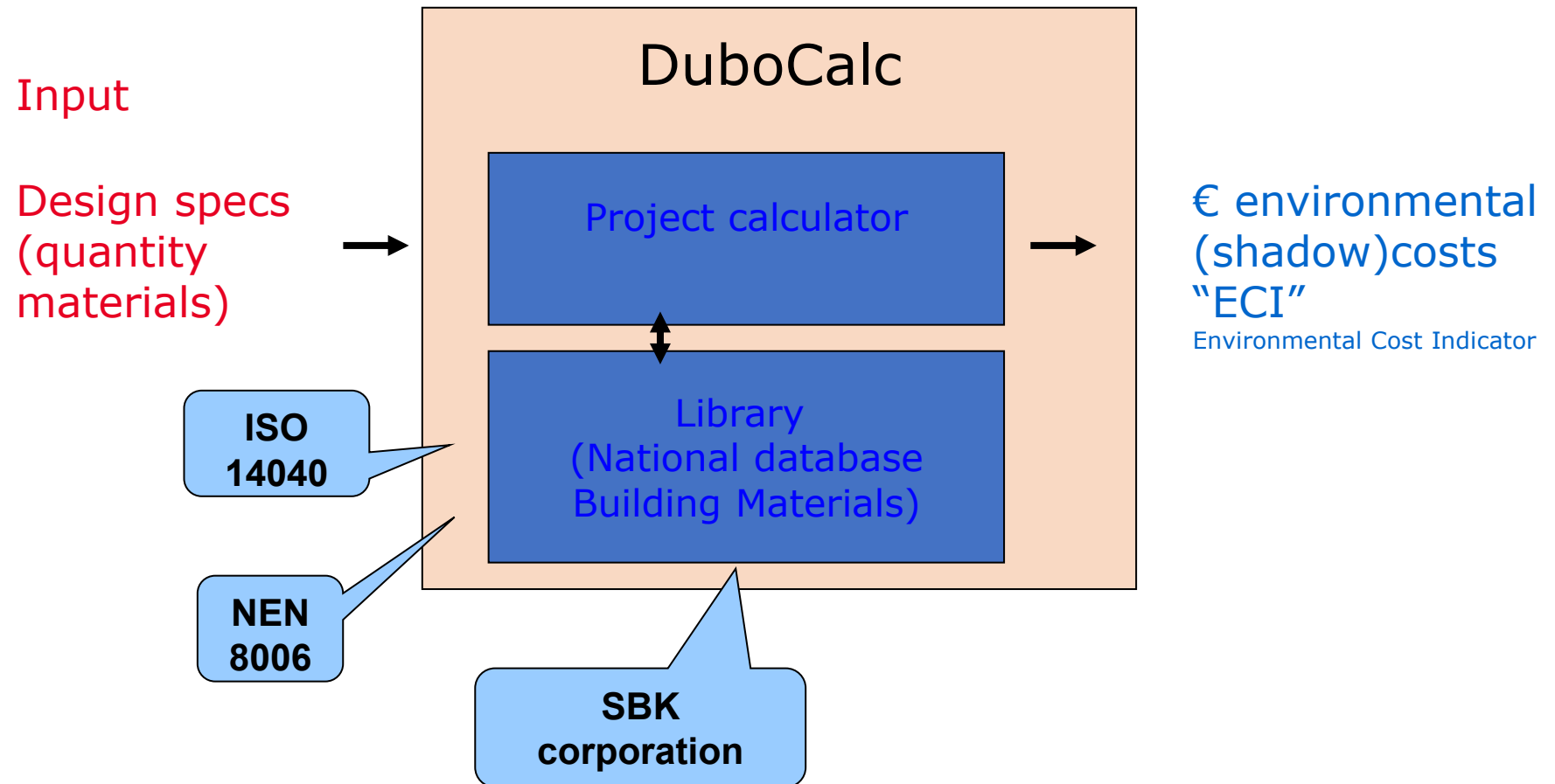


Which asphalt is more sustainable?



Dubocalc how does it work?

- DuboCalc calculates the emission of every step in the lifecycle.



Life Cycle Analyses

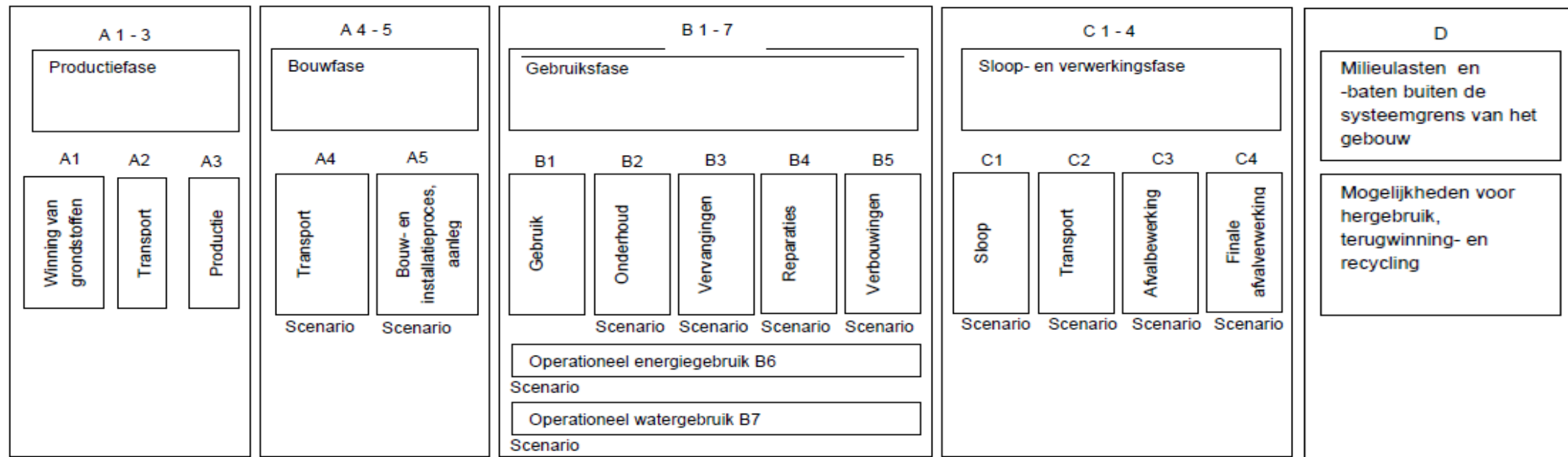
- An ECI value contains 11 environmental effects, each with a shadow price

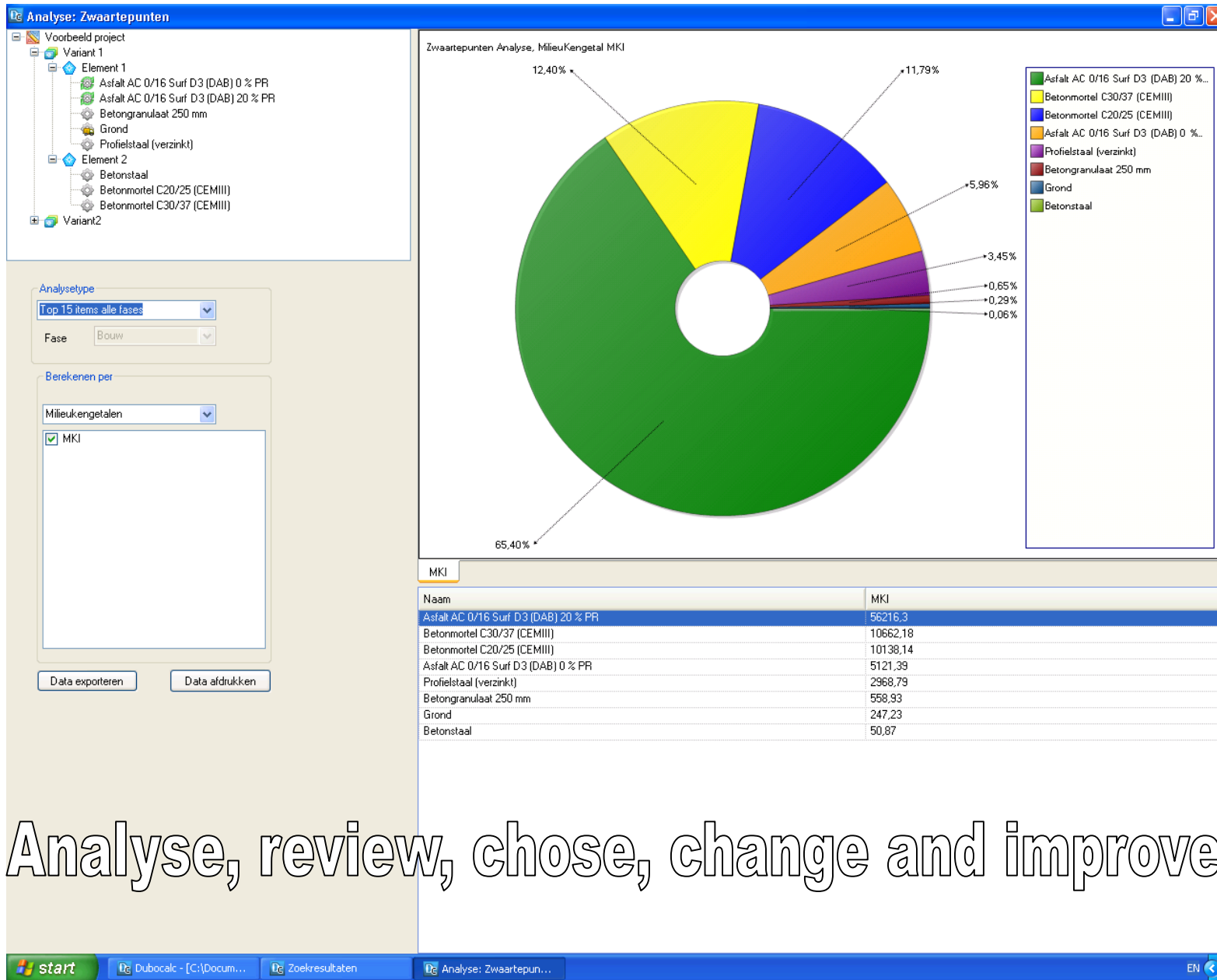
| Environmental effect categories | Equivalent unit | Weighing factors [€ / kg equivalent] | | |
|---|----------------------------------|--------------------------------------|---------------|----------------|
| Depletion of abiotic raw materials (excluding fossil energy carriers) – ADP | Sb eq | € 0.16 | Raw materials | 1-points score |
| Depletion fossil energy carriers – ADP | Sb eq ⁶ | € 0.16 | | |
| Climate change – GWP 100 j. | CO ₂ eq | € 0.05 | Emissions | |
| Deterioration ozone layer – ODP | CFK-11 eq | € 30 | | |
| Photochemical oxidant forming – POCP | C ₂ H ₄ eq | € 2 | | |
| Acidification – AP | SO ₂ eq | € 4 | | |
| Over-fertilization – EP | PO ₄ eq | € 9 | | |
| Human toxicity – HTP | 1,4-DCB eq | € 0.09 | Emissions | |
| Fresh water aquatic ecotoxicity – FAETP | 1,4-DCB eq | € 0.03 | | |
| Marine aquatic ecotoxicity - MAETP | 1,4-DCB eq | € 0.0001 | | |
| Terrestrial ecotoxicity – TETP | 1,4-DCB eq | € 0.06 | | |



Life Cycle Analysis method: EN15804

DuboCalc calculates the emission of every step in the lifecycle.



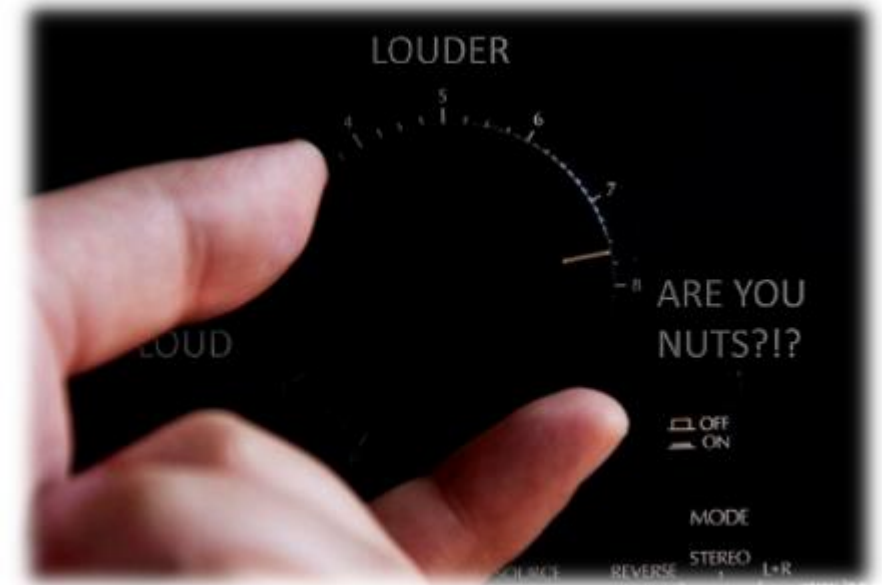


Analyse, review, chose, change and improve!



Using DuboCalc

1. As an awarding criterion in BPQR. The bidder with the lowest ECI (the most sustainable design) is best valued.
2. As a process requirement: optimizing during the design process.
3. As an optimizing designing tool and verification tool
4. As a minimum performance requirement (expressed in ECI).



Reconstruction Motorway A6 Almere

- Smart transportation solutions
- Smart use of asphalt (thicker foundation, thinner layer of asphalt)
- Generating its own energy (Energy neutral)
- Use of recycled materials
- Using new materials

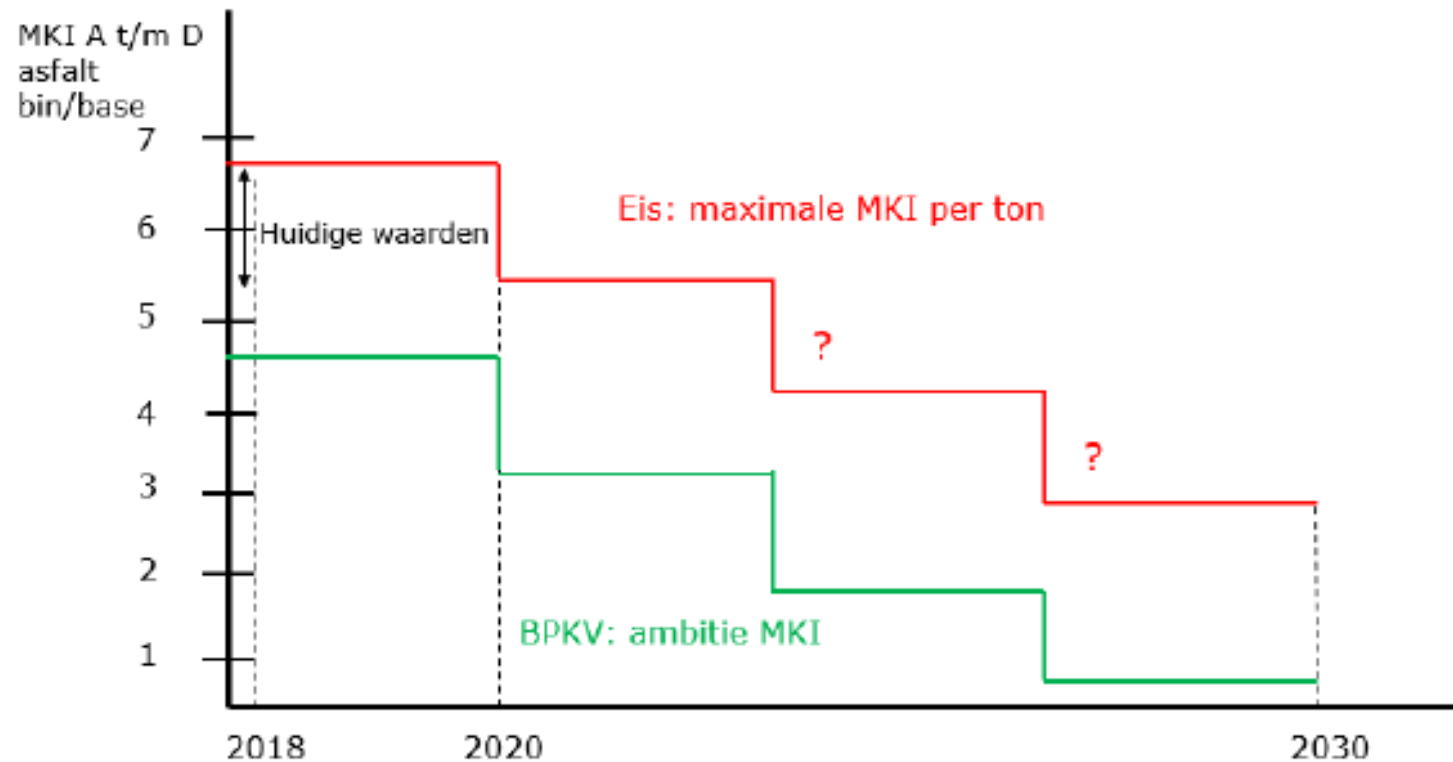


Winner Tender Procedure of the year



DuboCalc Light; Next steps: Maximum ECI values

| Asfaltmengsel | totaal |
|---|--------|
| 1. AC surf zonder PR | 8,1 |
| 2. AC Surf met 30% PR | 7,4 |
| 3. AC surf, mod. bit. | 9,8 |
| 4. AC surf, mod. bit. 30% PR | 8,8 |
| 5. AC bin/base 50% PR[1] | 4,9 |
| 6. AC bin/base 50% PR met gemodificeerd bitumen | 5,5 |
| 7. ZOAB Regulier | 8,1 |
| 8. ZOAB Regulier+ / DZOAB | 8,5 |
| 9. DZOAB 30% PR | 7,6 |
| 10. 2L ZOAB Toplaag mod. bit. | 9,8 |
| 11. 2L ZOAB Onderlaag | 7,9 |
| 12. 2L ZOAB onderlaag 30% PR | 7,3 |
| 13. SMA 8-11 | 8,8 |
| 14. SMA 5 | 8,8 |
| 15. Geluidsreducerende SMA deklaag[2] | 10,4 |
| 16. Waterbouw asfaltbeton | 14,6 |
| 17. Open steenasfalt | 12,9 |
| 18. Gietasfalt, waterbouw | 19,3 |
| 19. Asfaltmastiek, waterbouw | 24,4 |



Figuur 1. Daling boven- en ondergrens MKI-waarde asfalt (in fictieve getallen)





The use of:

- Functional Specification
 - DuboCalc
- Environmental Cost Indicator
 - Future steps

Any Questions?

Incorporating sustainability into Infrastructure projects The NL national perspective



Jeroen van Alphen

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ProCURE joint-cross border Pre- Commercial Procurement

*of breakthrough solutions for 100% renewable energy
supply in buildings*

Georg Vogt
Empirica
Germany



procuRE Joint Cross-Border Procurement

17.03.23 EAFIP - Construction, Infrastructure Security & Energy
Innovations in ICT Related Projects



**Pre-commercial Procurement of Breakthrough Solutions for
100% Renewable Energy Supply in Buildings**



@procure_pcp



bit.ly/procure-LI



procure-pcp.eu

Agenda

1 **procuRE Aim & Scope**

2 procuRE Status & Steps taken

3 Suppliers and Innovations

4 Lessons & Next Steps

Backup: Background on PCP and PPI Instruments



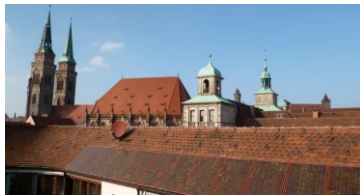
Barcelona, Spain



Eilat, Israel



Istanbul, Turkey



Nuremberg, Germany



Velenje, Slovenia



**Vila Nova de Gaia
(Porto), Portugal**



6 Procurers - 6 Countries
responsible for 21,000 Buildings

**1 Challenge: eliminating fossil off-side
supply in existing buildings**

€7.68 mio. for external R&D services

Budget spent in 3 phase competition

3 Schools - 3 Offices

procuRE tackles core bottle necks for Renovation Wave

Why procuRE?

WHY?

Energy supply, resilience, energy dependency, knock-on effects ...

MACRO-LEVEL (EU, Member States)

Renovation rate too low

Workforce already limited

Renovations do not deliver enough € and CO₂ savings

Investors perceive complex projects as risky

Great complexity (technologies, integration, organisation)

MICRO-LEVEL (Cities)

procuRE searches for a pivotal change on how renovations are planned and done

— What does procuRE want to achieve?

WHAT?

Active approach to building operation

Less work needed on-site

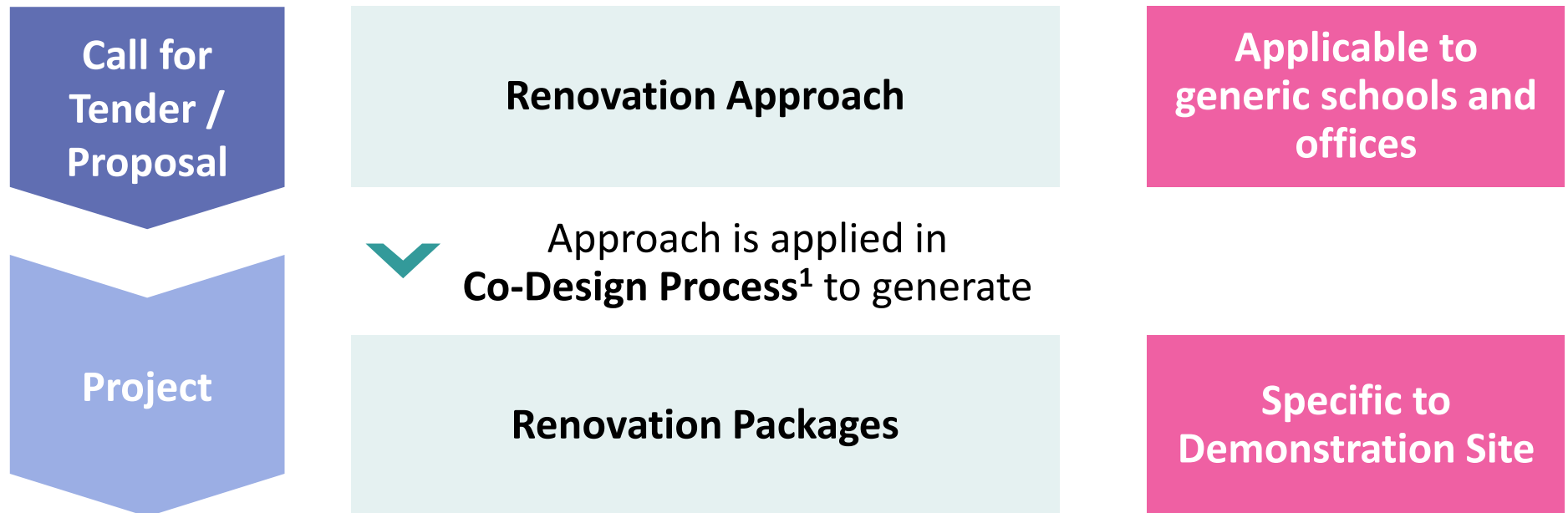
Maximum local RES as far as possible

**One-stop-shop with
clever Co-Design Procedure**

**Service contracting and financing to
reduce the burdens and risks**

procuRE develops two replicable innovations which are tested in the project through sites

How? Expected Outcome



¹ The extension of the design is continuous commissioning during operation

Agenda

1 procuRE Aim & Scope

2 procuRE Status & Steps taken

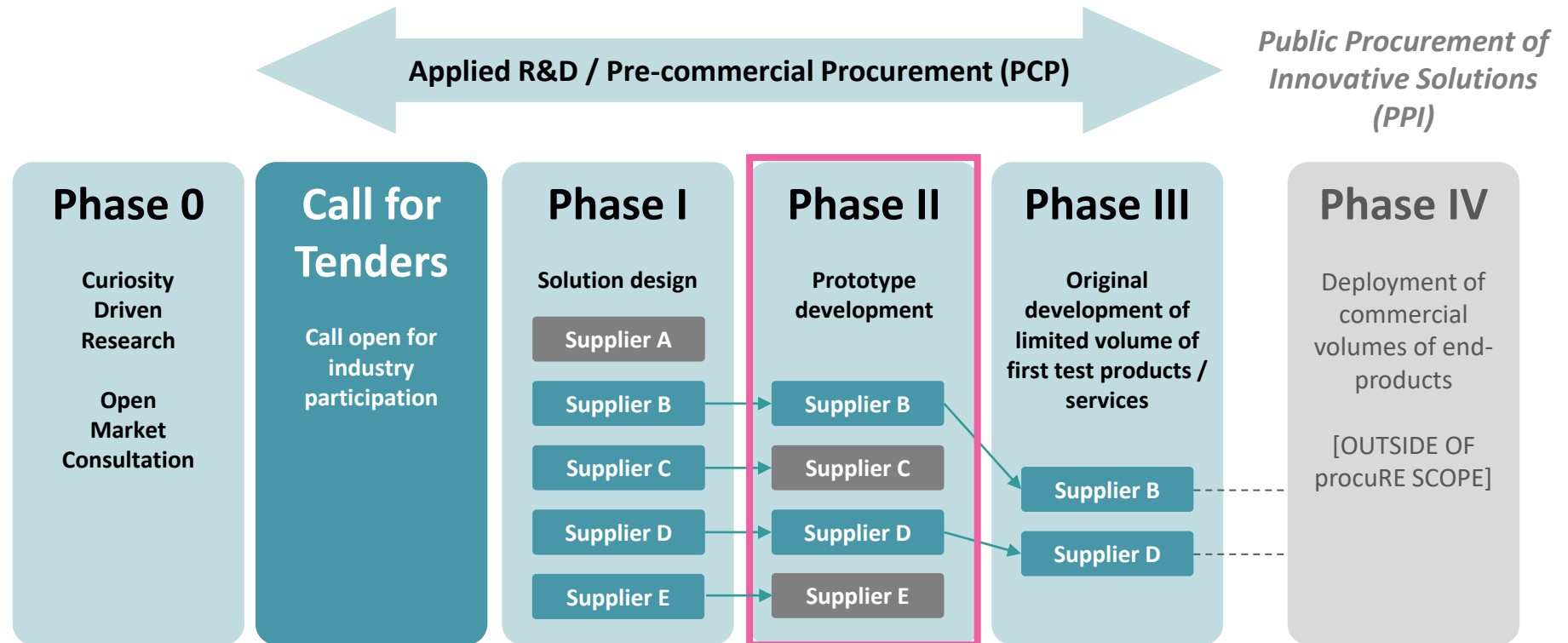
3 Suppliers and Innovations

4 Lessons & Next Steps

Backup: Background on PCP and PPI Instruments

procuRE is in Phase II just before Call-off for Phase III

Status procuRE



- ▶ Lead Procurer: KSENA, overall co-ordination of the procurers, acting on their behalf vis-à-vis the suppliers
- ▶ Procurers (also Buyers Group: Barcelona, Eilat, Istanbul, Nuremburg, Energaia)
- ▶ Suppliers (later Contractors) = organisations or consortia competing in the PCP process

procuRE is technology neutral

Phase 0: Solution design

**Buyers Group
defines the
(very
complex)
problem and
award criteria**

**Suppliers
define the
solution**

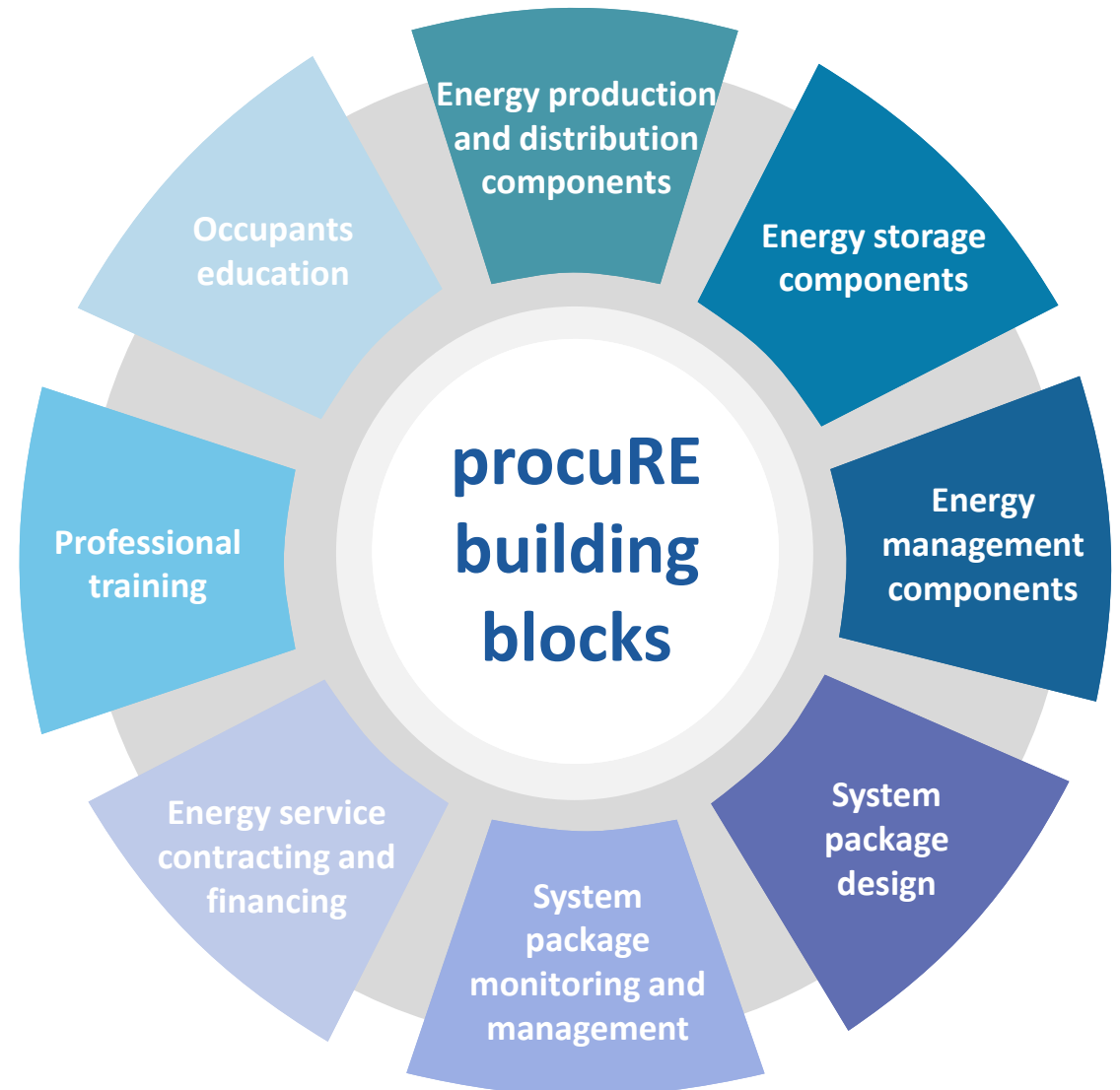
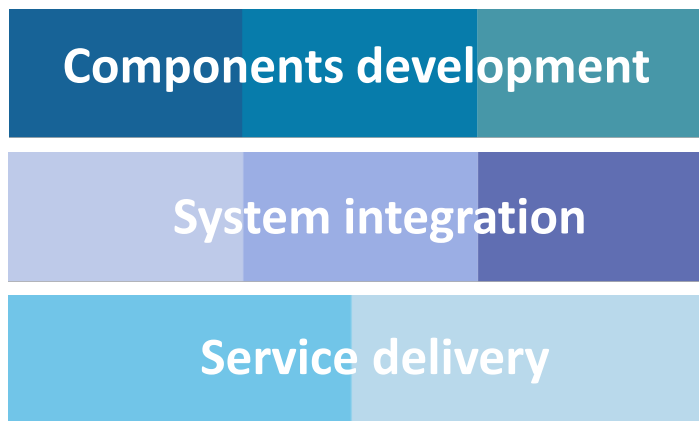
**...any constellation of technologies is thinkable if it is
applicable to other buildings, sustainable, etc. ...**

procuRE structures the common challenge for R&D services along eight building blocks

Phase 0: Building blocks

Our analysis identified eight blocks having **major shortcomings** which require **progress beyond the state-of-the-art**.

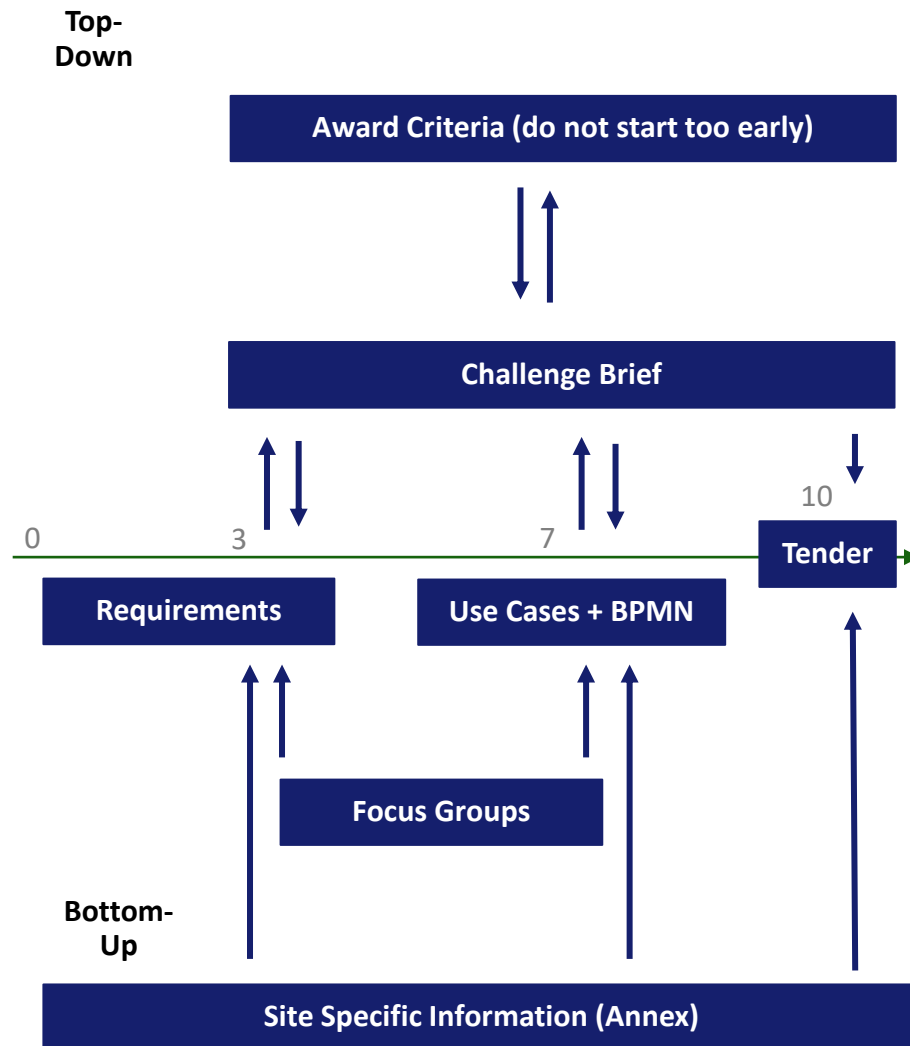
Blocks also became central elements for suppliers to describe their solutions.



Our approach follows two principles: 1) continuously develop with clear milestones; 2) the viewpoint on work (and of readers) matters

Phase 0: Challenge Brief creation

TOWARDS A CHALLENGE BRIEF



STRUCTURE OF THE CHALLENGE BRIEF

- ▶ Evaluation criteria determines
- ▶ Challenge brief + Technical Template structure
- ▶ And vice versa...

| (Weighted) Award Criteria | Challenge Brief | Technical Application Template |
|--|--|--|
| Technical Criteria | 1 Technical | 1 Technical |
| T1 System Integration | 1.1 T1 - System Integration | 1.1 T1 - System Integration |
| T2 Degree of achievement of objectives ... | 1.2 T2 - Degree of achievement of ... | 1.2 T2 - Degree of achievement of ... |
| ... | ... | ... |
| Section 3.4.2 includes: | Challenge Brief includes: | Technical Application Template includes: |
| <ul style="list-style-type: none"> ▶ Maximum points ▶ Thresholds / Weights ▶ Score scheme ▶ Formulas | <ul style="list-style-type: none"> ▶ Challenge description for each criterion ▶ Aspects relevant for assessment ▶ Annexes | <ul style="list-style-type: none"> ▶ Pre-defined sections, sub-headings and some standardised tables ▶ Notes on content expected |

- ▶ Easier for suppliers
- ▶ Easier for evaluators

The Renovation Approach is continuously improved; funding and time increases with each phase

Summary procuRE conditions

| Process phase | Results and activities expected | Buildings addressed by each supplier | Timeframe | N. of contractors selected (min) | Financing to each contractor (max) | |
|--------------------------|---|--|-------------------------------------|----------------------------------|------------------------------------|------------|
| Call for Tender Proposal | Renovation Approach | Concept design of Renovation Packages | 2 reference buildings in 2 climates | 3 Months (+2M Evaluation) | Open | - |
| Phase I | Continuous development through co-design approach | Schematic design of Renovation Packages | 6 Demonstration Buildings | M1-M3 (3) | 6 | € 192,000 |
| Phase II | | Detailed design of Renovation Packages and small scale tests | 6 Demonstration Buildings | M4-M11 (8+1) | 4 | € 576,000 |
| Phase III | | Installation and operation of Renovation Packages | 3 allocated Demonstration Buildings | M12-M27 (16) | 2 | €2,112,000 |
| | Continuous commissioning Final Version | | | | | |

Installations are to begin in the summer

Phase III: procuRE demonstration sites

VELENJE, SLOVENIA

- ▶ Primary school + linked Sports hall
- ▶ Envelope 20 years old
- ▶ Space heating: oil + electric



BARCELONA, SPAIN

- ▶ Offices + data centre
- ▶ 2010 upgrade to envelope (1850)
- ▶ Central heat pump with several splitters
- ▶ AC for data needs upgrade, monitoring installed since 2015



NUREMBERG, GERMANY

- ▶ Primary school + nursery
- ▶ Built 2015 to passive-house standards
- ▶ Natural gas condensing boiler (radiators)
- ▶ No RES; basic HVAC control system



ISTANBUL, TURKEY

- ▶ Office + bakery school
- ▶ Built 2015
- ▶ Variable Refrigerant Flow system
- ▶ No RES or monitoring



VILA NOVA DE GAIA (PORTO), PORTUGAL

- ▶ Primary school + nursery
- ▶ Built 2014 to national standards
- ▶ Natural gas boiler, heat pump for cooling
- ▶ Small solar thermal; advanced control system for building



EILAT, ISRAEL

- ▶ Future: Office + Maker + Exhibition
- ▶ Old terminal and tower - Built 1960
- ▶ Upgrades expected before phase III ¹
- ▶ Central HVAC, local AC systems, chillers



¹ Details of changes will be provided in tender specifications (Challenge Brief)

Agenda

- 1 procuRE Aim & Scope
 - 2 procuRE Status & Steps taken
 - 3 Suppliers and Innovations**
 - 4 Lessons & Next Steps
- Backup: Background on PCP and PPI Instruments

Industry player coming with background and developing process enabling them on smaller sites

Clarity platform integrates calculation, design, operation and management of all systems, facilities and installation of a building, in a systemic way, applying specific solutions for each stage, e.g., RES calculation software (DAE), energy modelling solutions, control and energy efficiency software and BIM software.

Both the platform and the result have been developed in a co-design process, integrating the needs and concerns of each Procurer. This philosophy is maintained in the resulting platform, and in the equipment proposed as a solution to approach renewable energy self-sufficiency in each case.



All components proposed in the Clarity platform, to get the maximum energy self-sufficiency, have been previously tested, have all the legal guarantees and are specifically chosen among the different families of equipment as the most efficient and innovative. PV panels, micro-wind generators, air-source heat pumps, H2 hubs, BESS systems are customized for each case to achieve optimum performance and results.

Clarity proposes the integration of different solutions, such as RESPIRA or EMS that incorporate AI algorithms that lead control, operation and maintenance. In the case of building facilities, RESPIRA can be integrated with the existing BMS system, providing setpoint and remote control, and predictive operation of all HVAC equipment.

Clarity offers O&M control and management remotely and shared with the local procurer through the online platform, applying predictive maintenance strategies using AI, and facilitating physical action in case of incidents, corrective and preventive, always counting on local providers perfectly coordinated with our staff.

 Renovation Approach for 100% renewable energy supply

Our economic proposal incorporates a blended financing model, based on both public and private investments, reinforced by the addition of existing in-country grants and local crowdfunding programs.

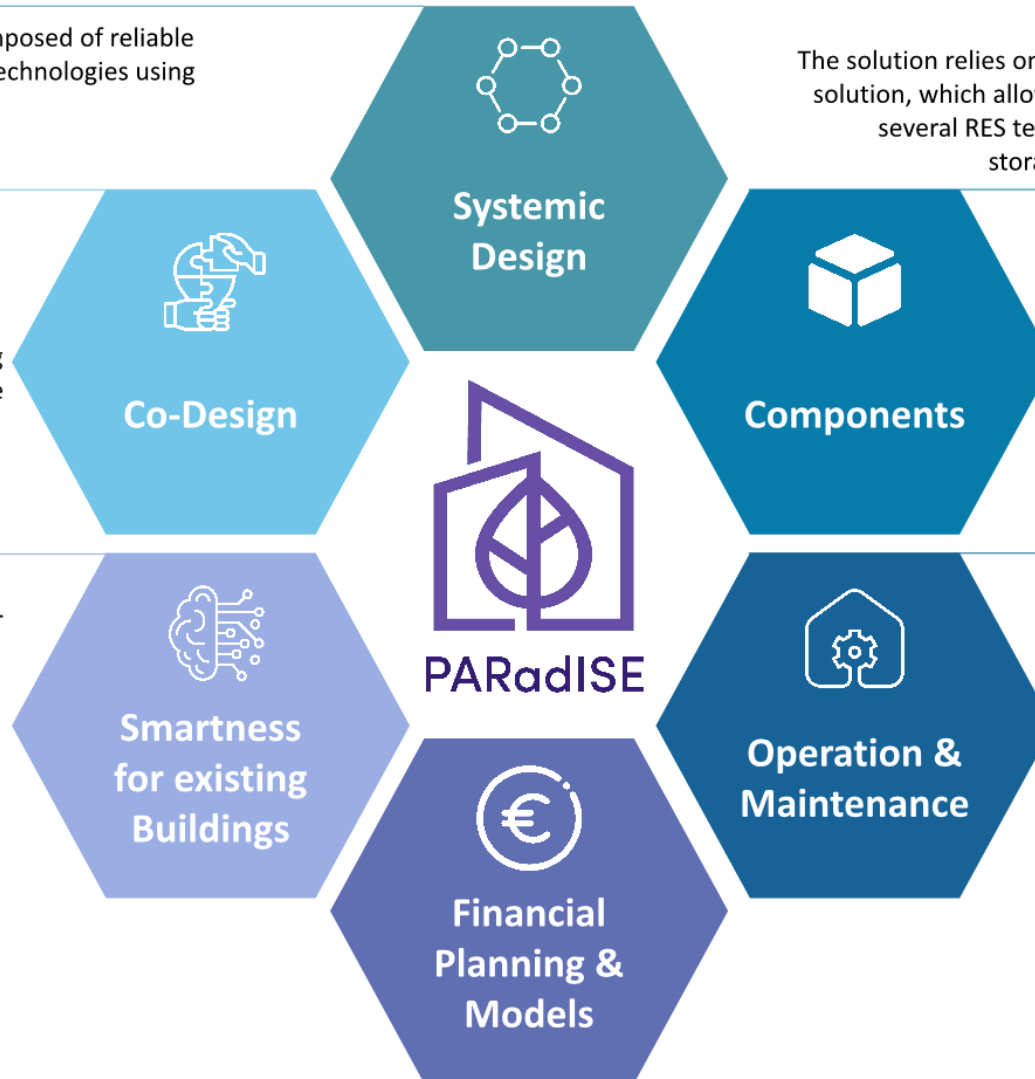
Diverse research with focus on integrating multiple innovative methods

PARadISE aims to provide a toolkit composed of reliable and modular hardware and software technologies using BIM as the major technology enabler

The technical solution is designed and fine-tuned between designers (PARadISE) and users (procurers, end users, operators, etc.) by the implementation of the Design Thinking standardized methodology. BIM will be present throughout the process, from the first design steps to the context-specific solution

PARadISE will deploy a SCADA System for BMS and EMS. The smart controller will work as the main communication channel and interface to integrate the on-site systems

 Renovation Approach for 100% renewable energy supply



The solution relies on HP technology as the core of the overall solution, which allows the integration and interoperability of several RES technologies (PV/PVT, small wind, etc.) and storage systems (both electrical and thermal)

PARadISE's O&M system will be based on a smart controller (SCADA solution) linked to a platform which gets real-time information to enable smooth and early mobilisation of the asset


PARadISE will analyse existing alternatives for implementing financial due diligence during the entire duration of the project, including a series of existing platforms and financing schemes that will facilitate the financial organisation and implementation of the retrofitting activities in the pilots. This will facilitate the consolidation of a solid framework on which to build together with procurers on tailored financial models

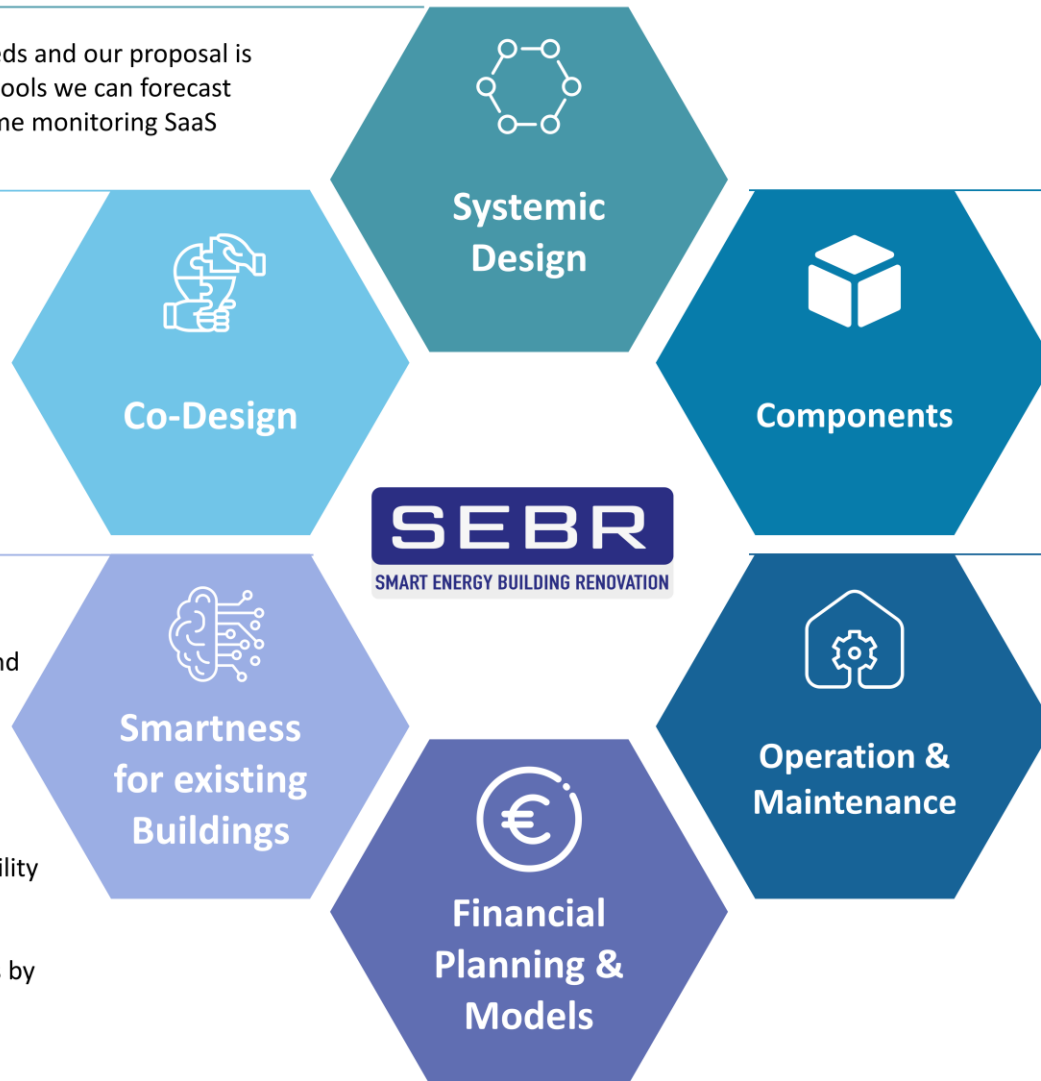
Multiple SMEs offering innovative components building a systemic approach

Every building has its own specific needs and our proposal is tailored to each one. With simulation tools we can forecast results and compare them with real time monitoring SaaS software

Co-design is key because during this process a matching takes place between our proposal and the buyers' expectations. We can simulate the best and worst case different scenarios (summer / winter) , agree upon the timing and budget.

Our SaaS platform monitors energy consuming appliances. Any given two parameters can be cross-checked to find relationships (temperatures, HR, HVAC status, weather forecasts etc). Analysis made by the EMS platform will also ensure the right decisions are made regarding energy production / usage. This SaaS is a powerful tool for the Facility Manager who can use it to find an optimum compromise between comfort & savings. It will ease his tasks by checking any deviations.

 Renovation Approach for 100% renewable energy supply



All components and devices have been previously tested and proven. The integrated solution will go beyond adding each performance as single components / devices generating a ripple effect.

CAPEX & OPEX costs are known beforehand. Wherever possible, local suppliers are chosen to provide better aftersales service, spare parts and minimise reaction times. Technical training will be provided to Facility Managers and also tips given to end users to raise awareness, foster behaviour changes to achieve energy savings

Different financing models are available, public-private funding, EaaS and crowdfunding to be decided in each particular case with the buyers.

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A lot can be controlled, some are beyond your control and some depend on your challenge

Lessons

THESE ARE “NOT” CHALLENGES

Cross-border cooperation / OMCs incl. outside EU
(> good project management)

Defining the common challenge
(> good research & support & moderation)

Evaluating in a group
(> good process & challenge brief)

CHALLENGES (OR WHAT TO KEEP IN MIND)

Always: **Avoid tendering during a crisis**

If you can: **try to split process innovation from technology innovation**

procuRE specific:
Talk to all accountants early (i.e. VAT)

Through Innovation Procurement horizontal & systemic challenges can be tackled no one will address otherwise

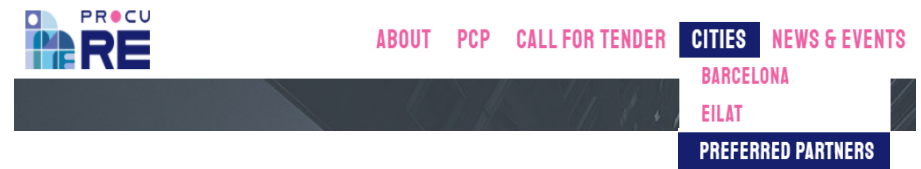
Any organisation on the demand side is invited to become a follower

Next steps

HOW TO BECOME A PREFERRED PARTNER?

- ▶ If you are interested in procuRE approach, become a preferred partner to:
 - Collaborate with the Buyers Group
 - Get access to all info about PCP results
 - Visit the Pilot Sites and receive reimbursement of travel cost to Open Pilot Days (subject to availability)
- ▶ **Steps**
 - Simply state your interest via mail to procure@empirica.com
 - Please include:
 - Brief motivation (goals related to procuRE)
 - Logo


PREFERRED PARTNERS ON OUR WEBSITE



WHAT DOES IT MEAN?

To contribute wherever possible to shape and validate the PCP goal by providing background information regarding the specific needs of (public) procurers. 

To collaborate with the consortium's Buyers Group and to meaningfully support the project's objectives. 

To be kept informed about all aspects of the PCP and afforded access to all information concerning the PCP results. 

To engage closely with the PCP Process, with a view to ultimately expanding the market uptake of the developed solutions through your own Public Procurement of Innovative solutions (PPI). 

To join us, [CONTACT US](#).

PREFERRED PARTNERS



Agenda

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Backup: Background on PCP and PPI Instruments

PCPs create incentives in domains where mature solutions are missing and reduce risks for both procurers and suppliers to innovate

Core features of Pre-Commercial Procurement (PCPs)

WHAT IS A PRE-COMMERCIAL PROCUREMENT (PCP)?

Instrument for public procurement of R&D services



Public procurers act as demanding customers



Tool for innovation
(EC sees the need but no offer on market)



Risk-benefit sharing under market conditions



Interact closely with six procurers operating 21,000 buildings



WHAT ARE THE BENEFITS FOR SUPPLIERS?

Create opportunities for companies to gain leadership in new markets

Provides a large enough demand to incentivise industry to invest in wide commercialisation

Development in stages and testing of innovative ideas under **real world conditions**

Suppliers retain **IPR ownership**, procurers gains access under limited conditions

Visibility on EU-Level

Pre-Commercial-Procurements (PCP) create a new, competitive market for Research and Development (R&D) services and development

Pre-Commercial Procurement vs. Traditional Public Procurement

PRE-COMMERCIAL PROCUREMENT

Joint Procurement (Buyers Group)

High degree of innovation / R&D effort required

Prototype development: medium-/long-term

Competitive development: several suppliers

New IPR – Risk/Benefit-sharing

Special legal framework in H2020/WTO

Development in multiple phases

TRADITIONAL PROCUREMENT

Individual Procurement (single department)

Low degree of solutions' innovation

Mature product/service: immediate/short-term

Single contract: one supplier

Often based on existing **IPR**

National public procurement rules apply

Development in one phase

PCP is for both, buyers and suppliers, a successful instrument benefiting SMEs in particular

Background on Innovative and Pre-Commercial Public Procurement

Opening a route-to-the market for new market players



Impact on stimulating cross-border company growth



Bringing research results to the market



Contribution to growth and jobs in Europe



Steady business growth



Deployment of solutions by procurers from the project



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We research, scale up and implement smart and digital solutions

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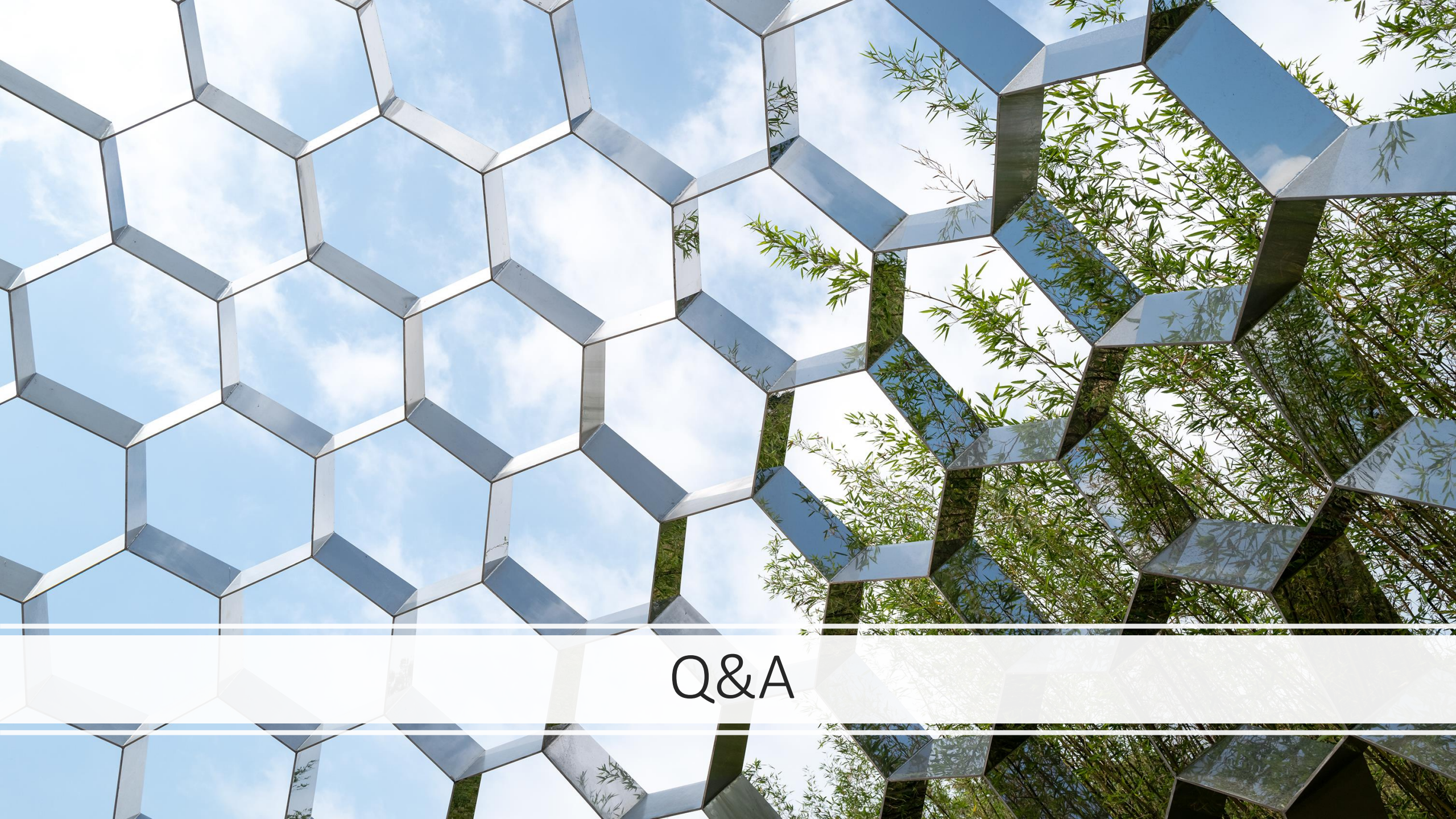
○ = Focus project

Source: empirica as of 01.01.2020

Verdygo design and construction technique

*that leads to a modular, sustainable sewage treatment
plant with an above ground setup and a simple plug &
play system*

Corporate video
Waterschapsbedrijf Limburg
The Netherlands



Q&A

A photograph of a modern cable-stayed bridge at night. The bridge features a large, illuminated arch structure supported by a massive concrete pier. The bridge deck is lit up, and the lights reflect on the calm water below. In the background, several tall buildings are visible, some with lights on. The sky is a deep blue, and the overall scene is illuminated by the bridge's lights and the city lights.

Conclusions & closure

Conclusions

- Innovation Procurement can be **used strategically to pull innovative green technologies.**
- R&D procurements help companies to **co-create and test their solutions immediately with potential customers which shortens time to market.** They provide also a first customer reference which can help attract financial investors to scale up your business.
- Public procurements of innovative solutions provide **large scale sales contracts in which public buyers act as early adopters of innovations.** This helps companies expand their business widely and diversify their offering to new market segments.
- **ICT tools applied can optimize the measurement and performance in projects.**



Apply for free assistance



For more information – see: www.eafip.eu

Or apply directly via:

<https://ec.europa.eu/eusurvey/runner/EAFIP2023>



Thank you for your attention

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**EAFIP WORKSHOP-WEBINAR HOSTED BY IPROCURENET IN
BRATISLAVA**

**CONSTRUCTION, INFRASTRUCTURE SECURITY & ENERGY
INNOVATIONS IN ICT RELATED PROJECTS**

17th March 2023

Q&A

Pre-Commercial Procurement of efficient construction and energy breakthrough innovative technologies

Speaker: Katarzyna Lenart, National Center for Research and Development, Poland

| | Question | Answer |
|----|---|---|
| 1. | Could you give an example of award criteria used in the project on the construction of social housing? | <p>In the project we are using four types of requirements (criteria):</p> <ul style="list-style-type: none"> - Mandatory requirements, that must be obligatory met by the technology, - Competitive requirements – technological parameters, by which contractors compete with each other, - Optional requirements, that the technology can meet optionally (it's contractor's choice), - Quality requirements, regarding the quality of technology. <p>The most important ones are the competitive requirements. In this particular project:</p> <ul style="list-style-type: none"> • Lowest turnkey construction costs; • Lowest operating costs for 30 years; • Lowest energy consumption; • Best energy balance; • Highest level of recycling of building materials; • Lowest carbon footprint of building materials; • Quality of Demonstrators' architectural solutions. |
| 2. | Are there any lessons learned regarding the strategic partnership with Poznan University of Life Sciences for the micro-installation testing in the biomethane plant project? | <p>Apart from providing access to the ground for construction of microinstallation, the strategic partner must provide professional personnel as well as laboratory and logistic facilities - this was crucial for conducting the tests. Thanks to such preparation of the strategic partner, the tests allowed to obtain full information about the operation of the micro-installation especially from the technological process side.</p> <p>The challenge was to deliver waste material to the microinstallations each day, however strategic partner took care of the process with its own equipment.</p> |

Sustainable Reconstruction of the Motorway A6, developing calculation tools and monetizing sustainability improvements in the procurement

Speaker: Jeroen van Alphen, *Rijkswaterstaat, The Netherlands*

| | Question | Answer |
|----|--|--|
| 1. | Is the impact of the distance of the supplier from the place of the project construction taken into account in the award criteria or in the DuboCalc tool? | <p>a) All transport distances are included as a non-changeable default value in Dubocalc. This means they are included in the total MKI value.</p> <p>b) The default value is fixed in the data and cannot yet be changed, but this will be possible in the future (within 2 years).</p> <p>c) At this moment this means that if you want a different value, you have to make a new LCA with a different value and/or means of transport for this.</p> <p>d) The MKI value of the entire project can be used as an award criterion.</p> <p>DuboCalc tutorials about how it works (in Dutch with English subtitles) are available here.</p> |
| 2. | Do you have any recommendations to define functional requirements? | Information about functional specifications (in Dutch, and possible to translate in Google) can be found here , here and here . |

ProcuRE joint-cross border Pre-Commercial Procurement of breakthrough solutions for 100% renewable energy supply in buildings

Speaker: Georg Vogt, *empirica, Germany*

| | Question | Answer |
|----|--|---|
| 1. | Did ProcuRE define different use cases depending on the type of buildings in the 6 different countries? | Yes, during research and design use cases were defined to describe what different user groups needed in order to be able to operate the building as efficiently as possible also taking current local energy production into account. |
| 2. | Could you give an example of security measures foreseen in phase 3 for the installations in the procuRE demonstration sites? | All installations have to comply with the respective national building code with regard to physical installations. As to ICT related security, state-of-the art solutions need to be deployed. In |

| | |
|--|--|
| | principle, a minimum amount of data will be required from users as the systems will be able to self-regulate rather than requiring individual control. |
|--|--|

Verdygo design and construction technique *that leads to a modular, sustainable sewage treatment plant with an above ground setup and a simple plug & play system*

Corporate video, *Waterschapsbedrijf Limburg, The Netherlands*

[Verdygo - A modular and sustainable waste water treatment plant](#)

[A flexible plant \(verdygo.com\)](http://verdygo.com)