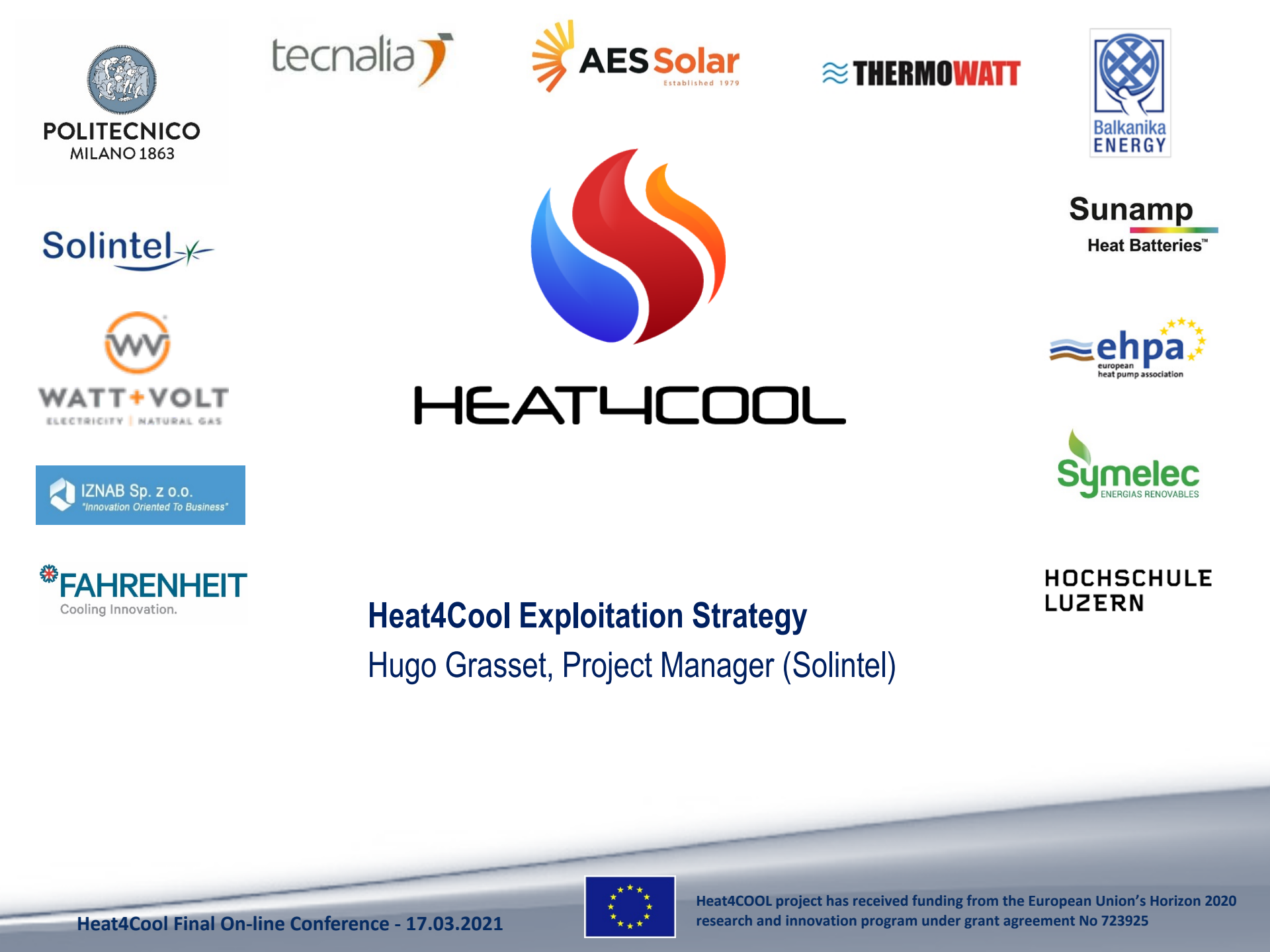

Heat4Cool Exploitation Strategy

Hugo Grasset, Project Manager (Solintel)

Heat4COOL project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 723925

Objectives:

Enforce an innovation management plan which contains:

- Identification of market needs for product or service alignment
- Monitoring competing technologies
- Establishing the ownership structure over different KERs
- Capturing IP value and defining exploitation strategies
- Evaluating new business model opportunities for the KERs

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The Heat4Cool Key Exploitable Results

Retrofitting design planner tool

Innovative HEX, cleaning methods, connecting screen

Solar PV assisted DC Heat Pump storage connected to advanced PCM heat energy storage

Solar assisted Thermal driven Adsorption heat Pump

SCI BEMS

Initial phase of the project

Construction, installation phase

Building use / Operational Phase

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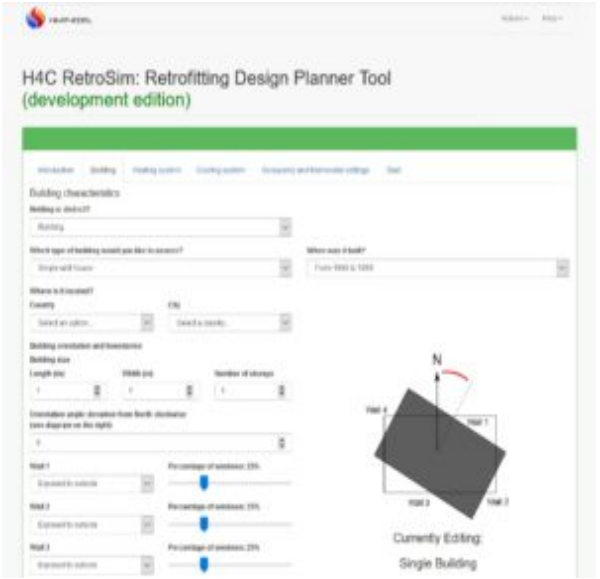
Retrofit Design Planner tool

Main features:

- Calculates main heating and cooling systems and alternatives
- Key performance indicators are estimated for current systems and alternatives suggested by the tool.



Unique selling point and fulfilled market needs:

- Accelerate initial solutions assessments with virtually no capital outlay and lesser need for qualifications.
- Lessened performance gaps or unexpected results

Exploitation approach:

The basic product for free, adaption on customer's product and consulting services as a paid service.

KER ownership:

tecnalia

Other partners interested in exploitation:

POLITECNICO MILANO 1863

Symelec ENERGIAS RENOVABLES

Lucerne University of Applied Sciences and Arts
HOCHSCHULE LUZERN

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Innovative HEX, cleaning methods, connecting screen

Main features:

- increasing system-operation safety and simplicity
- more efficient cleaning and avoidance of sludge accumulation

Unique selling point and fulfilled market needs:

- Alternative energy source (green energy). Specific heat exchangers for the sewage water recovery case.
- Large capacity installations, potentially multi MW size scaling.
- High energy efficiency.
- Flexible installation.
- Better heat exchanger efficiency maintenance due to the cleaning control

Exploitation approach:

Direct sale of improved Heat exchanger on already existing technology.

Other partners interested in exploitation:

Solintel Symelec ENERGIAS RENOVABLES

KER ownership:

THERMOWATT

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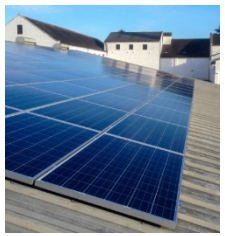
Solar PV assisted Heat Pump connected to advanced PCM heat energy storage

Main features:

- The system will allow the combination of generation and storage in a way that results in a greater percentage of harvested energy being used for the end demand than is currently possible.

Unique selling point and fulfilled market needs:

- Small, modular and versatility
- Higher thermal energy production efficiency
- Primary energy consumption savings - better renewable energy percentage.
- Independence from the grid.



Exploitation approach:

Sunamp: Direct sale of PCM storage for connection with PV assisted heat pump systems/ distribution of complete heat pump systems with Sunamp heat batteries to projects globally or to other OEMs

AES Solar: Potential for integration with in house PV systems and in projects

KER ownership: Sunamp Heat Batteries™ AES Solar

Other partners interested in exploitation:

Solintel Symelec ENERGIAS RENOVABLES

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Solar assisted Thermal driven Adsorption heat Pump

Main features:

Generation of cooling thermal energy from solar energy, achieving high electrical efficiencies as well as the possibility to increase the solar collector surface and thus the heating production.

Unique selling point and fulfilled market needs:

- Higher cooling energy production efficiency.
- Renewable heating energy production and thus primary energy consumption savings.
- High cooling capacity at high outdoor temperatures compared to state-of-the-art technologies.
- Compact design and fast adsorption characteristics.

Exploitation approach:

Fahrenheit: Direct sale of adsorption heat pump for connection with solar thermal systems.

AES Solar: Potential for integration with in-house solar thermal systems and in projects

Other partners interested in exploitation:

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KER ownership: FAHRENHEIT Cooling Innovation. AES Solar Established 1979

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SCI BEMS

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SCI BEMS

Main features:
SCI-BEMS is an integrated energy management platform for optimizing the operation of HVAC equipment in the building and district level.

Unique selling point and fulfilled market needs:
Profitable interaction between the energy systems balancing user comfort, energy efficiency and services to the grid thanks to profiling mechanism.

Exploitation approach:
Commercialization in the WATT + VOLT product portfolio through installation fees and license fees for cloud service.
Integration of SCI BEMS features in existing app portfolio offering.

KER ownership:

WATT+VOLT
ELECTRICITY | NATURAL GAS

Other partners interested in exploitation:

AES Solar
Established 1979

tecnalia

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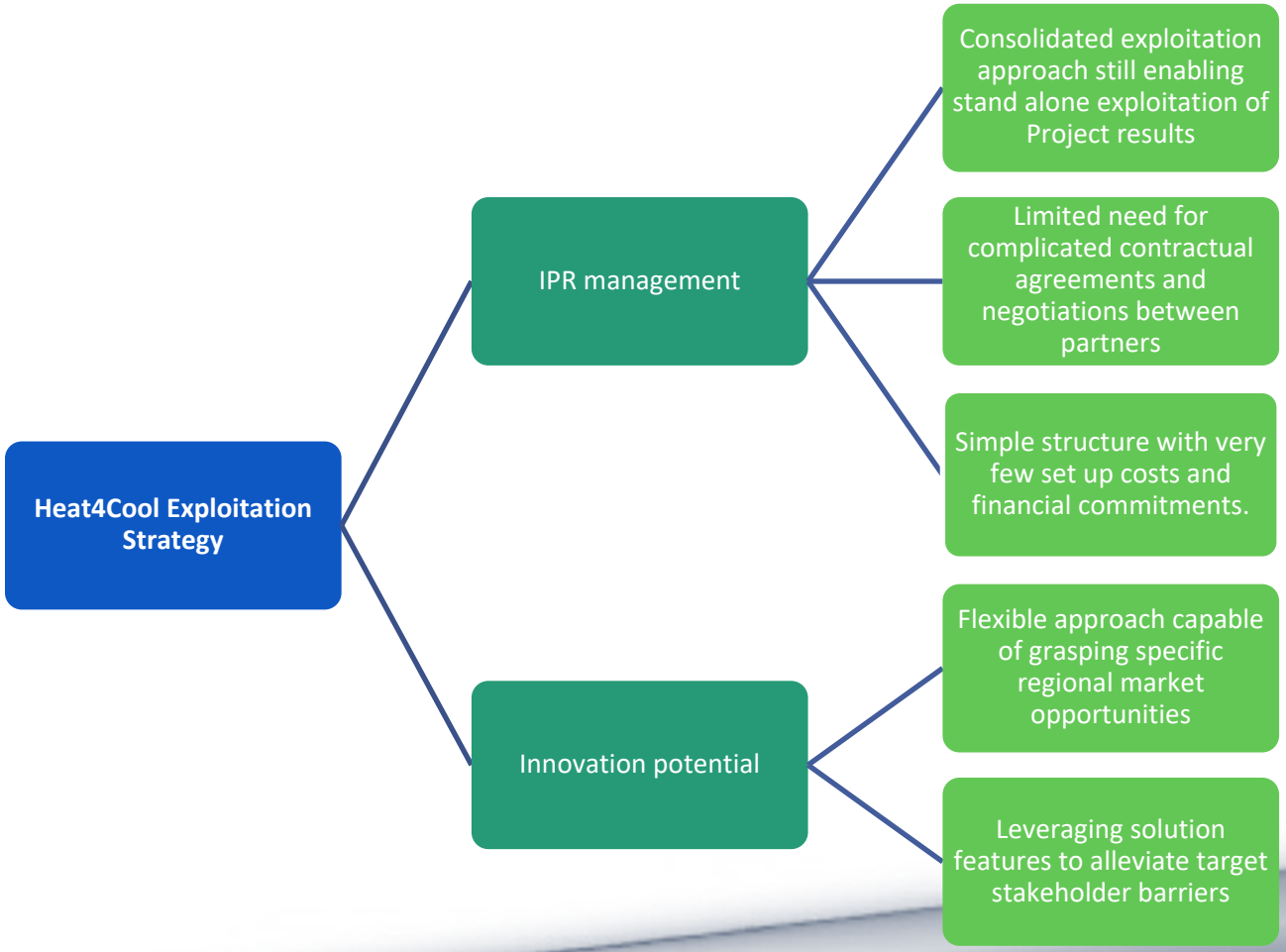
Heat4Cool Retrofit Solution

Specific challenges and necessities of the Heat4Cool project



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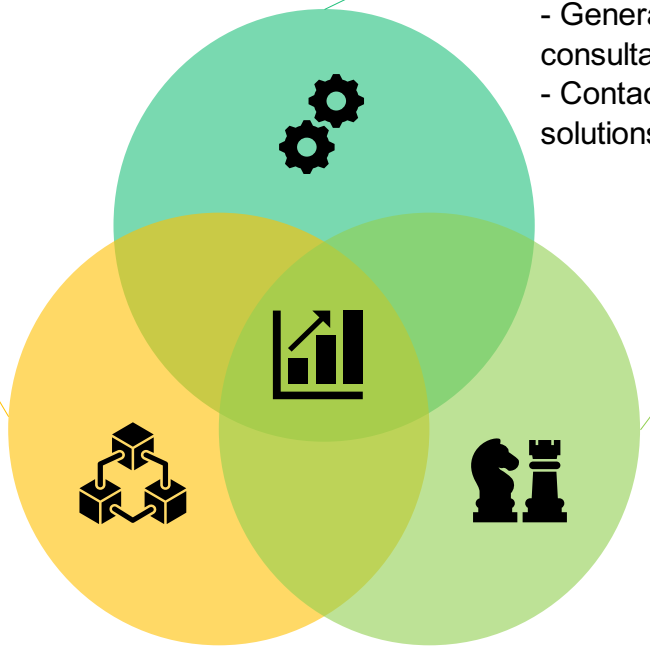
The Heat4Cool Retrofit Solution business approach

Operations

Key activities: - Product specialists
- General contact points and retrofit solution consultants
- Contact points and potential installers distributing solutions in their regional markets.



Structure

The Heat4Cool Retrofit approach assessed in the project will be a **non-equity strategic alliance** where partners retain independance and relationships, committments and rights are contractually defined.

Strategy

Hybrid heating and cooling virtual one stop shop approach.
- All inclusive model for markets with the required partner coverage
- A coordination model with contractors in uncovered regional markets

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The Heat4Cool Retrofit Solution business approach

Services:
- Retrofit planning and assessments
- Installation
- Consulting

Revenue:
- Direct sale of systems and consulting for product owners according to scheme in following slide.
- Consulting fees for the coordination model.
- Consulting and contracting fees for the inclusive model.

Customers:
- Homeowners, public bodies
- Architects, engineers and consutrction stakeholders

Competencies:
- Product owners
- Contractor, contruction, engineering
- Contact point/ Consultants

Two types of cost:
- The ones that pertain to individual partner activities such as production of their individual systems and solutions or shipping are covered independently.
- Costs pertaining directly to Heat4Cool based elements (web-platform and infrastructure and marketing) are collectivized

Management
- General assembly of partners in strategic alliance codified by contractual agreements of the strategic alliance.

Product
Listed KERs as demonstrated in following

Distribution and capturing customers
- Web platform
- Partner networks
- Regional clusters and integration in existing One Stop Shop intiatives
- Use of H4C Retrosim as initial hook (more specific and prescriptive then many current One Stop Shop ICT entry tools)

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Thank you.

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