



FLEXharvester

by VITO / EnergyVille



FLEXHARVESTER ©: TECHNOLOGY PLATFORM FOR CAPTURING THE FINANCIAL GAINS OF ENERGY FLEXIBILITY

Erik De Schutter
VITO / EnergyVille



“RESEARCH CENTER” ?







From the point of view of a smart city

CO₂-reduction?

Hire experts?

Too much data?

Shall I be unburdened?



From the point of view of a network operator

Concrete enough: is it a solution?

Operational/industrial level? ('utility grade')

Answer to our needs?

(no 'research because of the research itself')

Shall I be unburdened?

A person with dark hair, wearing a blue button-down shirt, is looking down at a laptop. The image is overlaid with a green binary code (0s and 1s) pattern, giving it a digital or tech theme.

From the point of view of a software house / solution provider

Proven & tested?

Market and business case?

Continuity: will they be here tomorrow?

Shall I be unburdened?

We are going to take away these
inconveniences



TECHNOLOGY PROVIDER !

CUSTOMER (B2B)

**TECHNOLOGY
MARKET**

**PRODUCT/SERVICE
MARKET**

Makers

**= customers from
VITO / EnergyVille**

Inventors

Users



WHICH MARKETS? (B2B)

delaware

ABB

Capgemini

FERRANTI
computer systems

PRODUCT/SERVICE
MARKET

TECHNOLOGY
MARKET

Product & Service Providers

(=hardware manufacturers, software houses,
solution providers, system integrators)

Technology Providers

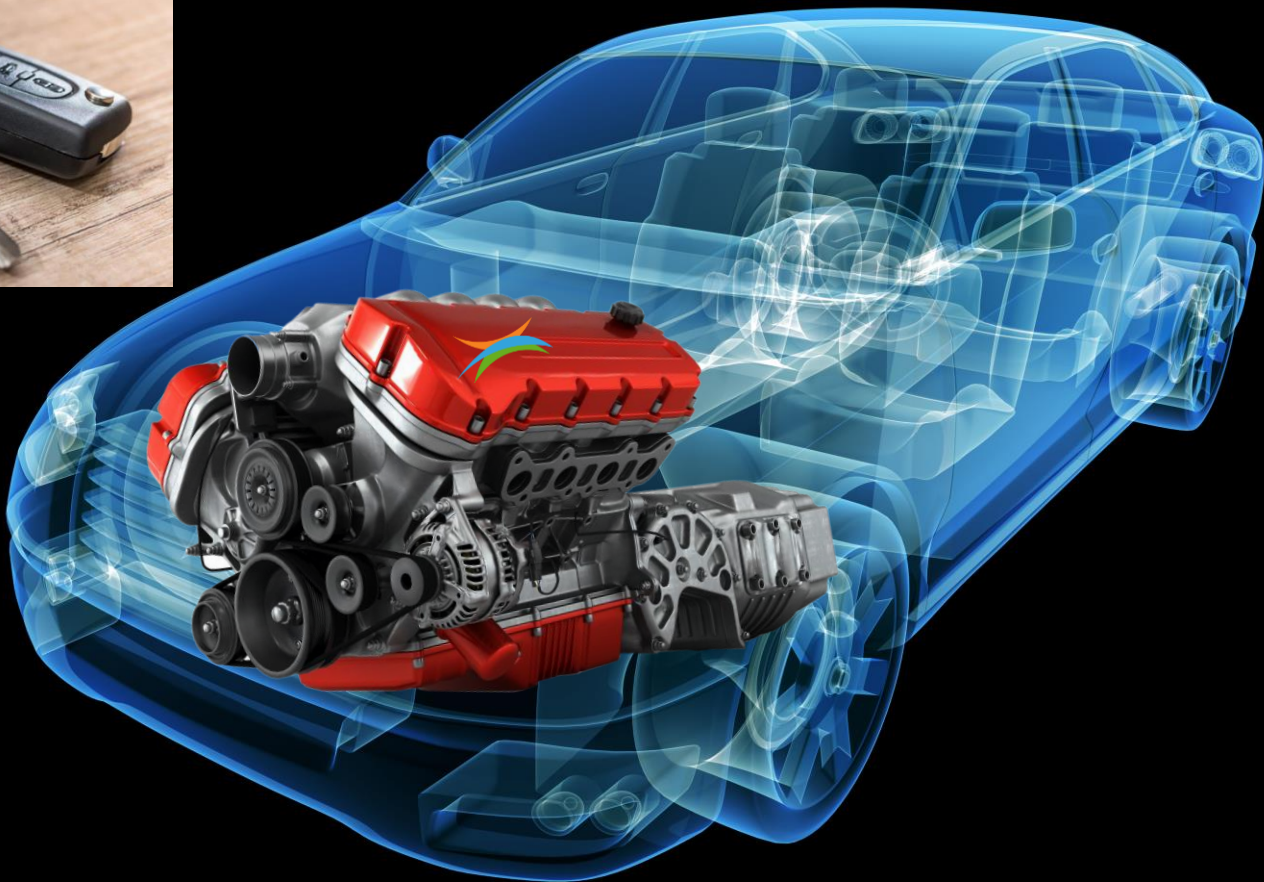


Product & Service Users

(=utilities)

fluvius

ennatuurlijk



REGIONAL INSIGHTS



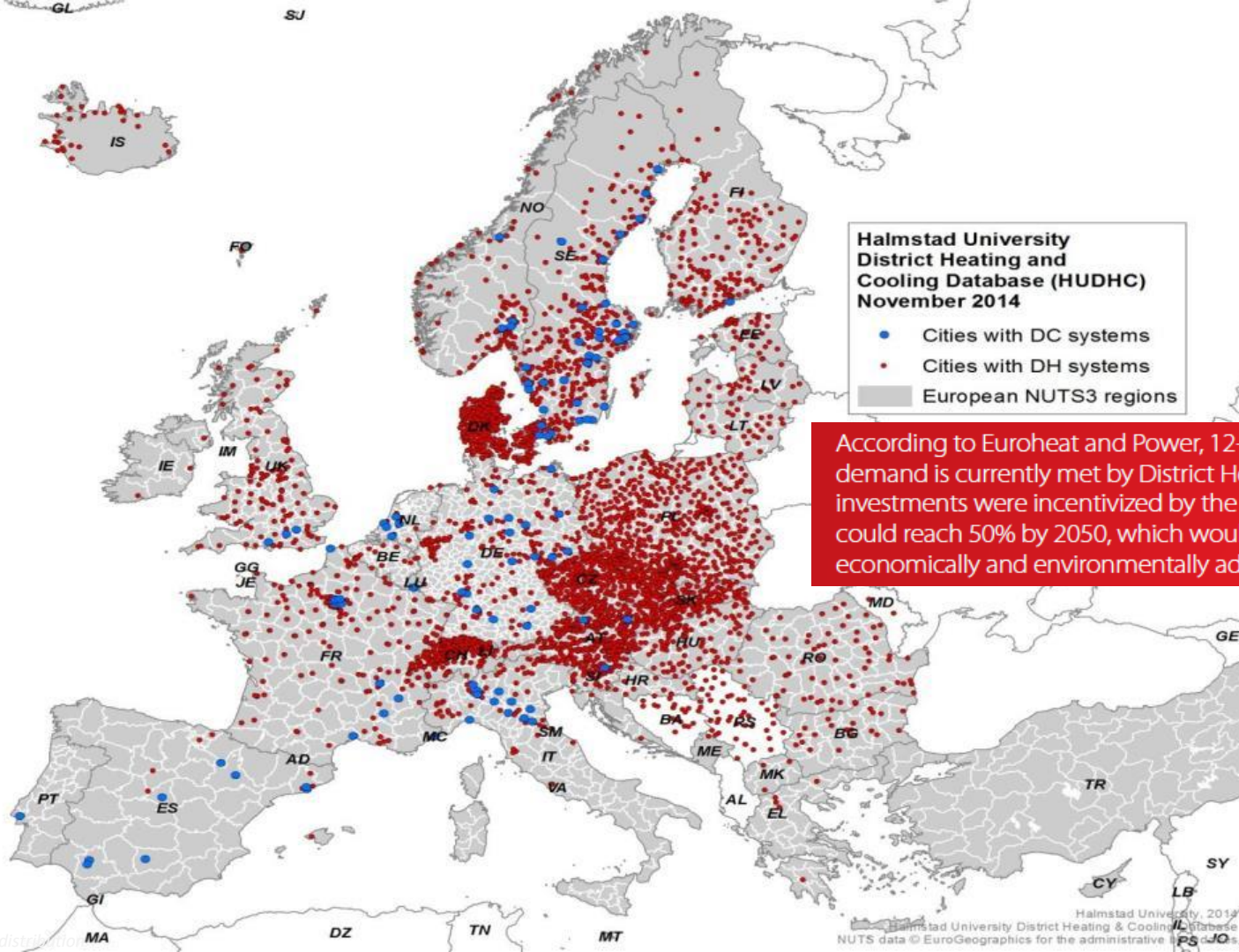
Annual energy consumption
by 2024: **>19,000 PJ**

Global industry
size (2017):
>\$180 BN

Commercial district
heating application
CAGR (2018-24):
>6%

Residential
district heating
application CAGR
(2018-24): **>4%**





According to Euroheat and Power, 12-14% of Europe's heat demand is currently met by District Heating. If appropriate investments were incentivized by the EU, this number could reach 50% by 2050, which would prove to be both economically and environmentally advantageous.

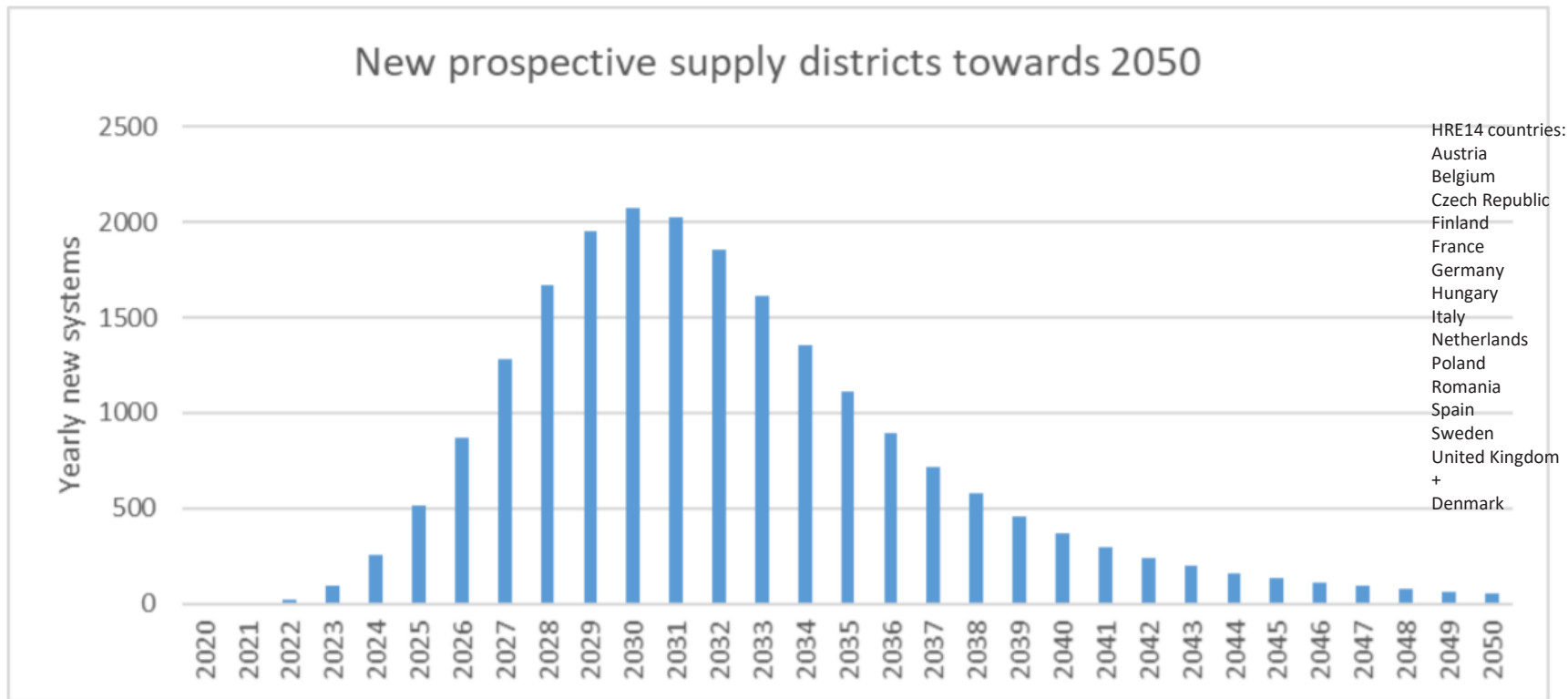


Figure 5-3. Approximate newly established and total amount of district heating systems in HRE14 and Denmark needed for fulfilling the potential of distribution grid investments below 4 EUR/GJ. $X50 = 2030$, $m = 4$.

APPLICATION BENEFITS FOR DISTRICT HEATING NETWORK OPERATORS/OWNERS, THE CUSTOMERS OF THE SOLUTION PROVIDERS

- Production mix optimization (peak vs base)
- Large Heat Pump electricity market interaction optimization
- CHP electricity market interaction optimization
- Extra heat consumers with existing production assets and infrastructure, for networks that are at the limit of connecting heat consumers
- Renewable energy sources integration improvement
- CO₂ reduction

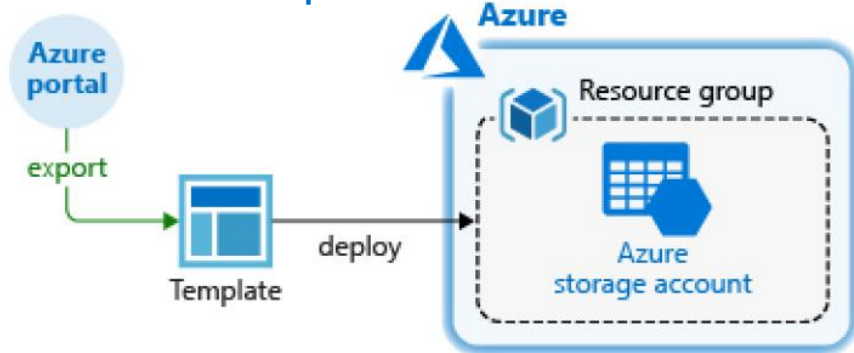




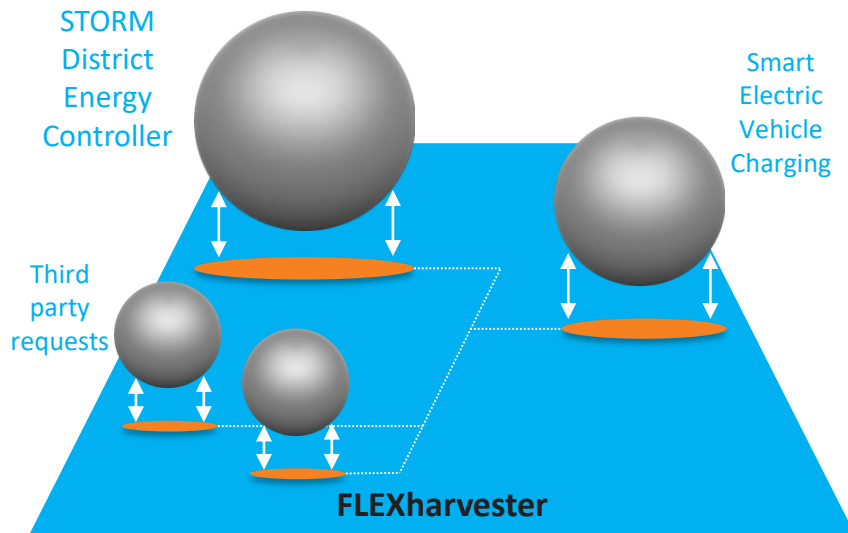
FLEXharvester is a data storage, management and visualization **platform** for all energy flexibility applications developed by VITO / EnergyVille.

- Based on **Microsoft Azure** cloud computing platform
- Replicable **ARM template**

Microsoft Azure Marketplace



STORM District Energy Controller is the first application built on the FLEXharvester platform.



⇒ We deliver the solution design, the solution architecture and the **blueprint**

TECHNOLOGY ARCHITECTURE

Applications
= value for the user
(utility)

**Energy flexibility
harvesting platform**
= value for the
VITO/EnergyVille
customer (solution
provider/system
integrator/service
provider)

Cloud platform

Application requests => your input as Solution Provider is essential!

**STORM
District
Energy
Controller**

**Smart
Electric
Vehicle
Charging**

**Building
Flexibility**

...

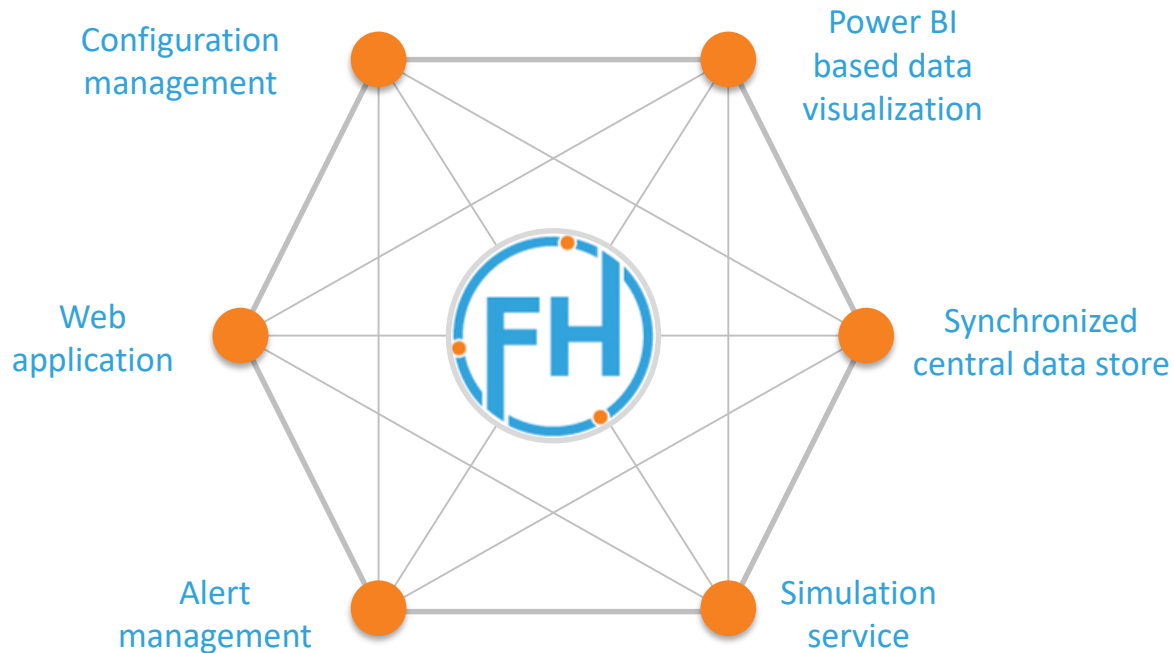
FLEXharvester

Microsoft Azure

VITO/EnergyVille
ambition: launch
one new
application per
year

FLEXharvester
is only licenced
including at
least one
application.

MAIN COMPONENTS



PORTFOLIO / PLANS

FLEXharvester Pilot

A solution to pilot FLEXharvester running as a managed service at VITO/EnergyVille (*)

FLEXharvester Solution

As a system integrator you design (**), integrate, deploy and manage the solution yourself with VITO/EnergyVille support for the STORM District Energy Controller (***) application

FLEXharvester Tech Transfer

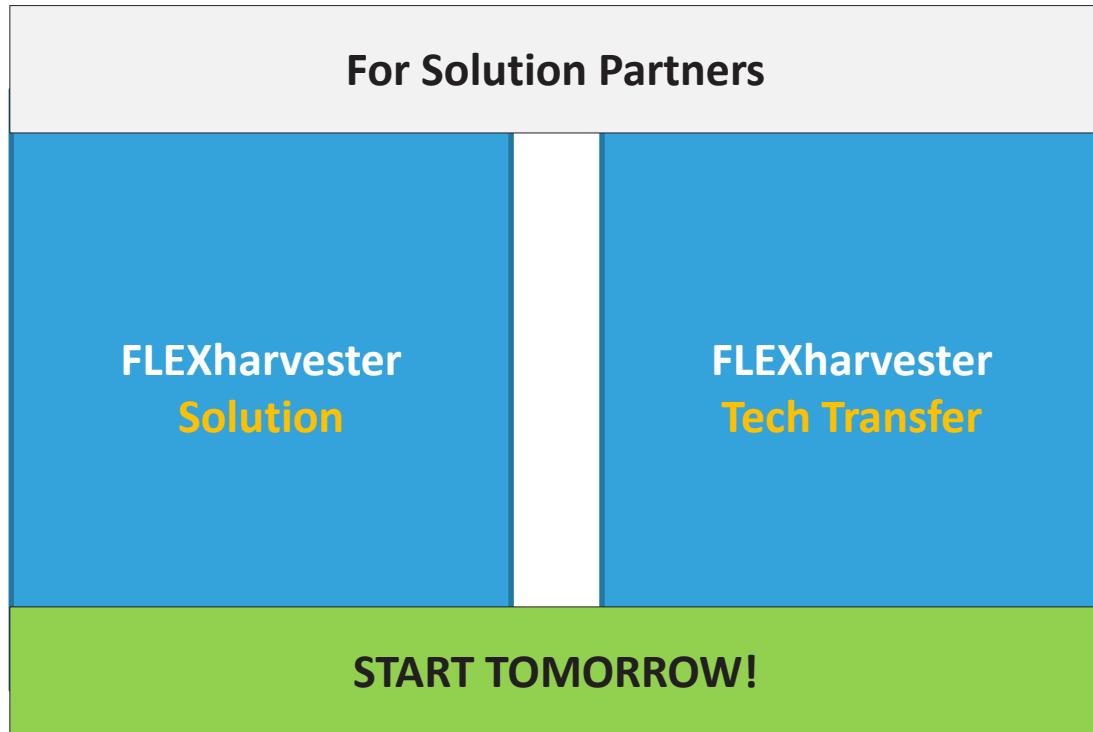
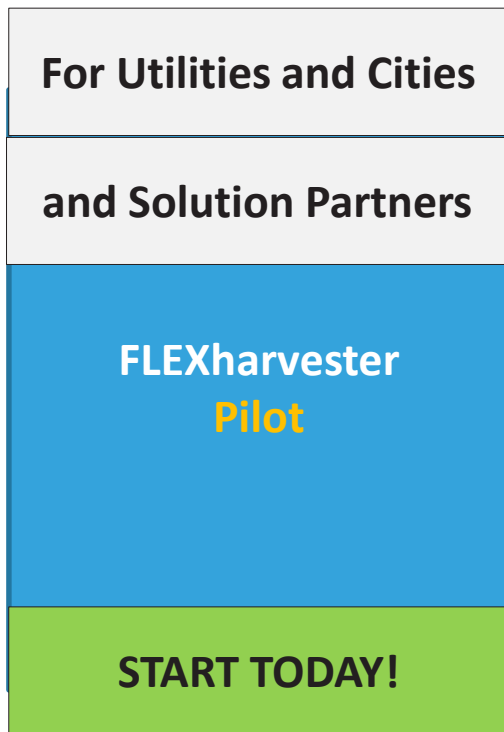
As partner you receive the source code and are able to tune and adapt the FLEXharvester including the STORM District Energy Controller solution according to your and your Customers' needs

(*) Or a third party Microsoft tenant

(**) VITO/EnergyVille can support you in the design, configuration and tuning in a first phase

(***) STORM District Energy Controller is also available as separate product

PORTFOLIO / PLANS



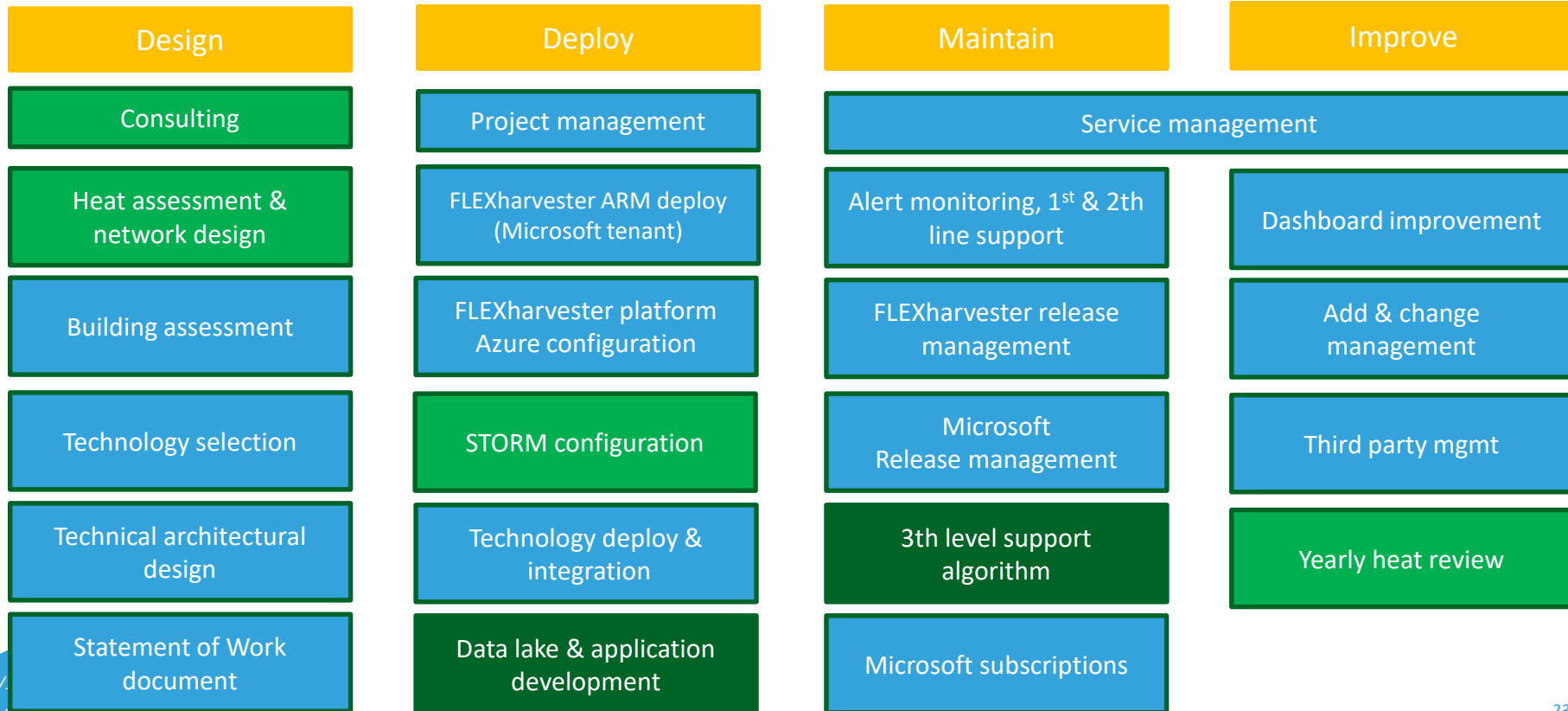
FLEXHARVESTER PILOT

Scope : Projects for demonstration or pilot projects, limited in time

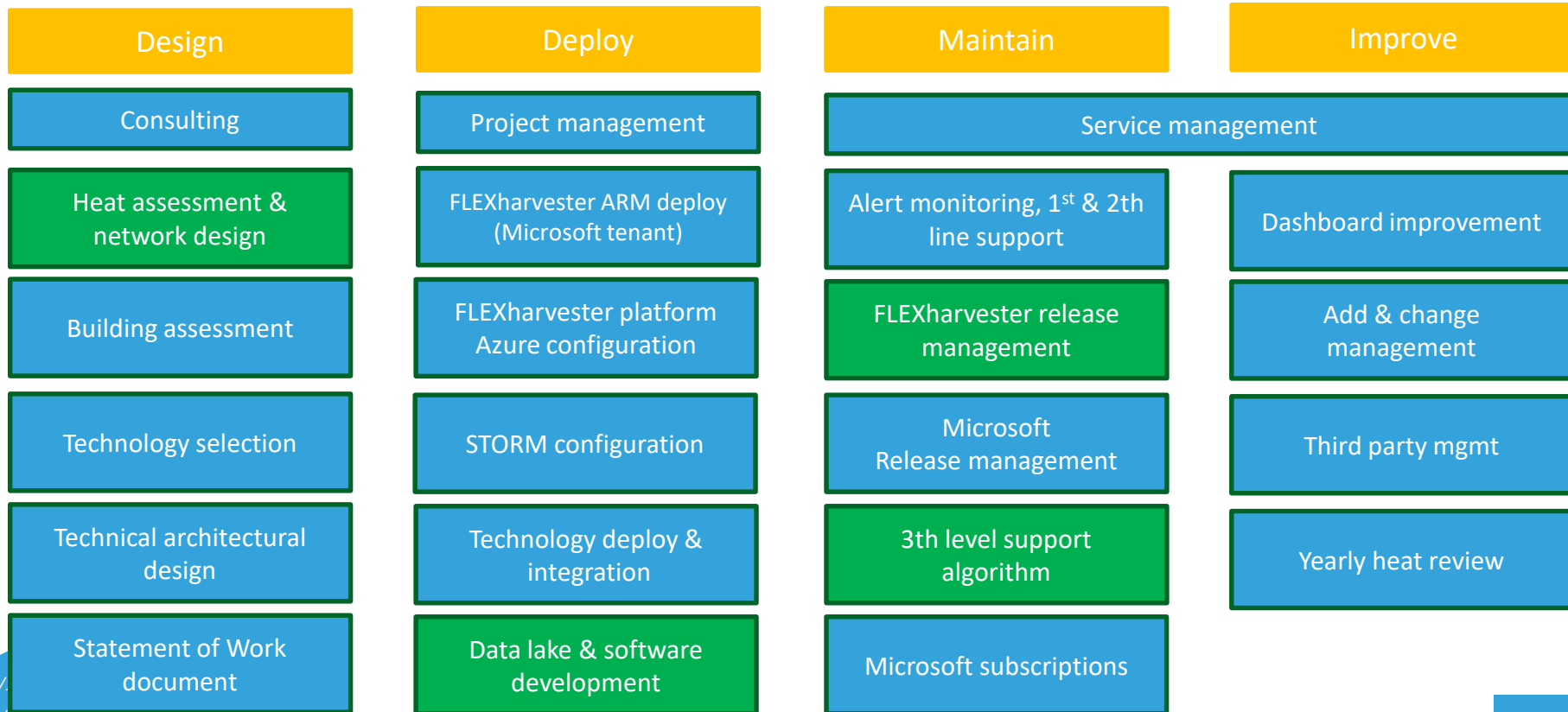
Design	Deploy	Maintain	Improve
Consulting	Project management	Service management	
Heat assessment & network design	FLEXharvester ARM deploy (Microsoft tenant)	Alert monitoring, 1 st & 2 th line support	Dashboard improvement
Building assessment	FLEXharvester platform Azure configuration	FLEXharvester release management	Add & change management
Technology selection	STORM configuration	Microsoft Release management	Third party mgmt
Technical architectural design	Technology deploy & integration	3th level support algorithm	Yearly heat review
Statement of Work document	Data lake & application development	Microsoft subscriptions	

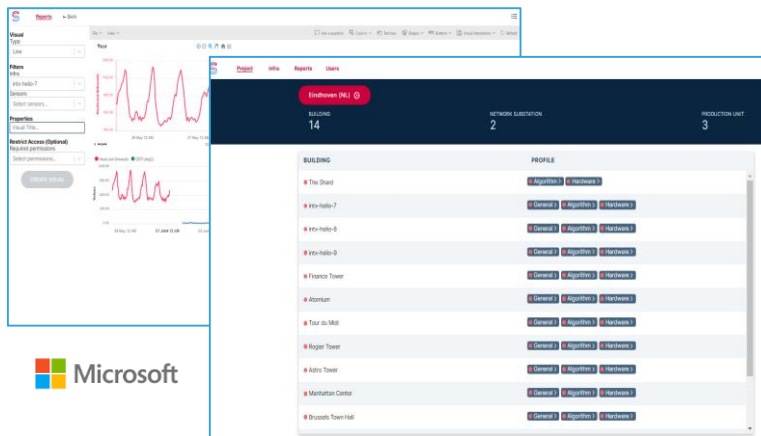
FLEXHARVESTER SOLUTION

Scope : Integrator/Solution/Service Provider integrates FLEXharvester and VITO/EnergyVille technology in his product/service



FLEXHARVESTER TECH TRANSFER Scope : Partner manages the project and the source code by himself, with support of VITO





A ready to use ARM template supporting easy configuration of sensors, network, buildings, data lake, dashboards and algorithms.

With the **FLEXharvester** ARM template you easily install the total suite of software components on your Microsoft Azure subscription. Using our template, solution providers reduce the implementation time in the field. Our open connection philosophy on every component allows also integration with any other technology or customization.

Ongoing support and feature development by a renowned Energy Research organization

FLEXharvester is a spearhead technology in VITO/EnergyVille's District Heating and Cooling roadmap for at least 5 to 10 upcoming years. A continuous stream of new features will fuel your innovation and make it future proof. EnergyVille's extensive field tests of all components de-risks your development

FLEXharvester for Thermal Networks

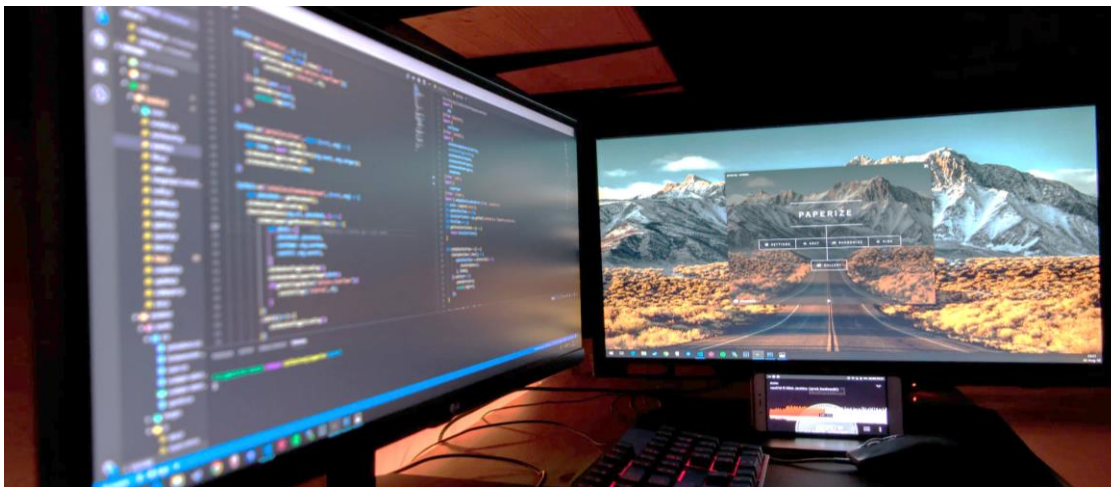
The **FLEXharvester** software components allow integrators, network operators, building management system providers and real estate companies to **enhance** their project **right away** with the **STORM District Energy Controller** for flexibility management and demand response capabilities.

Using Microsoft products like IOT Hub, Power BI and Devops, the **STORM District Energy Controller** can be deployed as a solution to a wide network of Microsoft Partners.

Microsoft Partners will tune **FLEXharvester** to your and your customers' needs, apply the FLEXharvester application **STORM District Energy Controller**'s control objectives that maximize the net return for every specific thermal network, and enhance your customer interaction experience.

VITO - ENERGYVILLE'S FLEXHARVESTER PLATFORM BUILDS ON MICROSOFT IOT HUB , MICROSOFT AZURE AND MICROSOFT POWER BI

Built with the Microsoft Azure ARM template concept, the platform integrates the ongoing research developments in demand response applications of thermal networks. It enables Microsoft Solution Providers worldwide to understand, integrate and deploy energy flexibility solutions based on Microsoft apps and platforms.



A Microsoft Azure PAAS solution

The platform can grow building by building. No worry on capacity and performance. Microsoft Azure platform and management portals monitor the needed capacity. You start small and grow along with your Smart City project.

Easy interact with any certified Microsoft IoT Hub device and Microsoft Edge

Microsoft IoT Hub allows you to connect our application virtual with a broad range of connected gateways and sensors. The IoT hub provides security, authentication , communication and manageability between buildings and the **FLEXharvester** asset database and log service.

Build your own dashboard with Microsoft Power BI in no time

Microsoft Power BI model makes the visualization of building and heat network data easy. You can create memorable personalized reports or dashboard on impact and savings thanks to the **FLEXharvester** application.

Understandable repository structure and manage application life cycle with Microsoft DevOps

Azure DevOps influences the application lifecycle throughout the planning ,development, delivery and operational phases. With **FLEXharvester** we deliver a documented and well defined structure and repository.

WHAT IS FLEXHARVESTER?

Open energy flexibility platform

1

Energy flexibility

FLEXharvester is an easy portable open data model and architecture for building energy flexibility management solutions.

2

Technology standards

FLEXharvester has been developed based on market standards like Microsoft Azure, Microsoft IOT hub, Microsoft Power BI and Python.

3

Open framework

FLEXharvester is open to integrate with any other technology and applications via API's or to other platforms.

4

Partner ecosystem

FLEXharvester offers an eco-system of technology partners supporting its open data model and architecture.

5

Smart solutions

Energyville is proposing a wide stack of smart flexibility solutions running on FLEXharvester that lower the TCO and fasten-up deployment in the field.



We bring you

Familiar platform/tools

Packaged expertise

Profitability

Shortening learning curve

Faster go to market

Innovation

Sustainability

Reliability

Trust

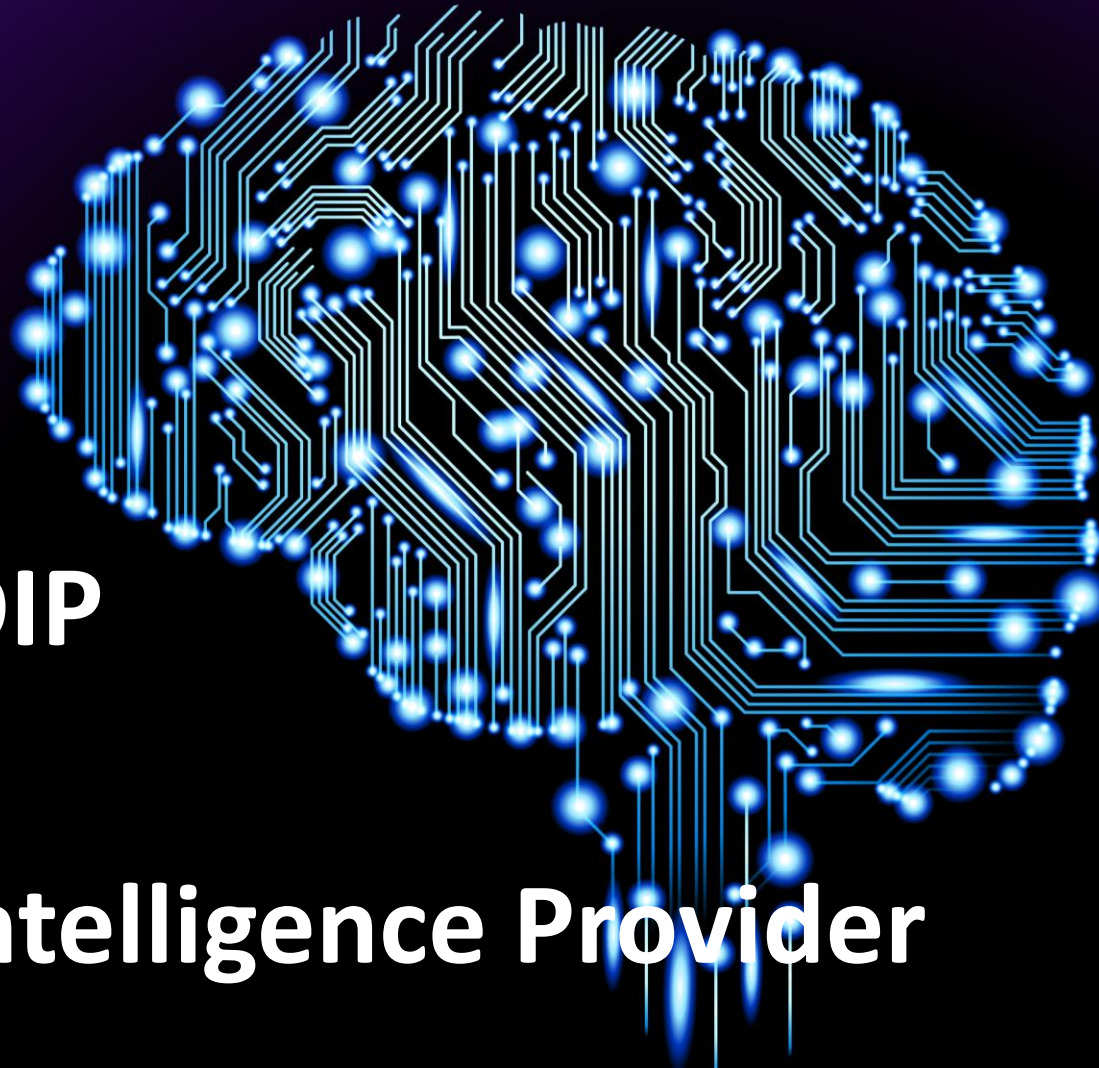


FLEXharvester helps system integrators and software developers to provide in a familiar and trusted environment energy flexibility solutions to their customers - network operators, esco's and local energy communities.

In a standardised environment, with proven technology, for a faster market introduction, with a 100% investment in sustainability.



SOFTWARE ENGINES



DIP

Data Intelligence Provider

AI OEM 4 DH & EU

Artificial Intelligence

**For District Heating to
grow to 4th Generation**

**Original Equipment
Manufacturer**

**For Energy Utilities in
EUrope**

INVITATION

- We invite **solution providers** as partners to build products and services based on VITO/EnergyVille's technology on the FLEXharvester platform
- We invite **utilities and cities** to step into our energy flexibility pilot projects, and to experience the added value
- We invite **everybody** to be part of the eco system and deliver input: which from your energy and sustainability issues can we solve together with our present and future technology?

Login in our **FLEXharvester** ARM demo

Visit the Microsoft Azure Marketplace :

<https://azuremarketplace.microsoft.com/en-us/>

Call us for more information: +32 492 977 923

Email us: erik.deschutter@energyville.be

More info: www.flexharvester.com

<https://www.energyville.be/en/storm-district-energy-controller>

