



FLEXharvester
by VITO / EnergyVille

**FLEXHARVESTER™:
TECHNOLOGIE PLATFORM VOOR
HET OOGSTEN VAN ENERGIEFLEXIBILITEIT**



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VITO / EnergyVille

ENERGIEFLEXIBILITEIT

INNOVATIE

ONDERZOEKSINSTELLING





An aerial night view of a city, likely Amsterdam, with a river and light trails from traffic. The image is overlaid with a digital, futuristic aesthetic, featuring glowing blue and orange lines and patterns that suggest data flow and connectivity. The text is overlaid on this background.

Vanuit het standpunt van een slimme stad

CO₂-reductie?

Experten aanwerven?

Te veel data?

Word ik ontzorgd?

A low-angle, upward-looking photograph of a complex industrial system. Numerous large, polished metal pipes of varying diameters curve and intersect, creating a dense network. Some pipes have valves and flanges. The background shows structural elements of a building, like steel beams and walkways, suggesting an indoor industrial facility. The lighting is bright, highlighting the metallic surfaces.

Vanuit het standpunt van een netwerkoperator

Concreet genoeg: is het een oplossing?

Van operationeel/industrieel niveau? ('utility grade')

Afgestemd op onze noden?
(geen 'onderzoek om het onderzoek')

Word ik ontzorgd?

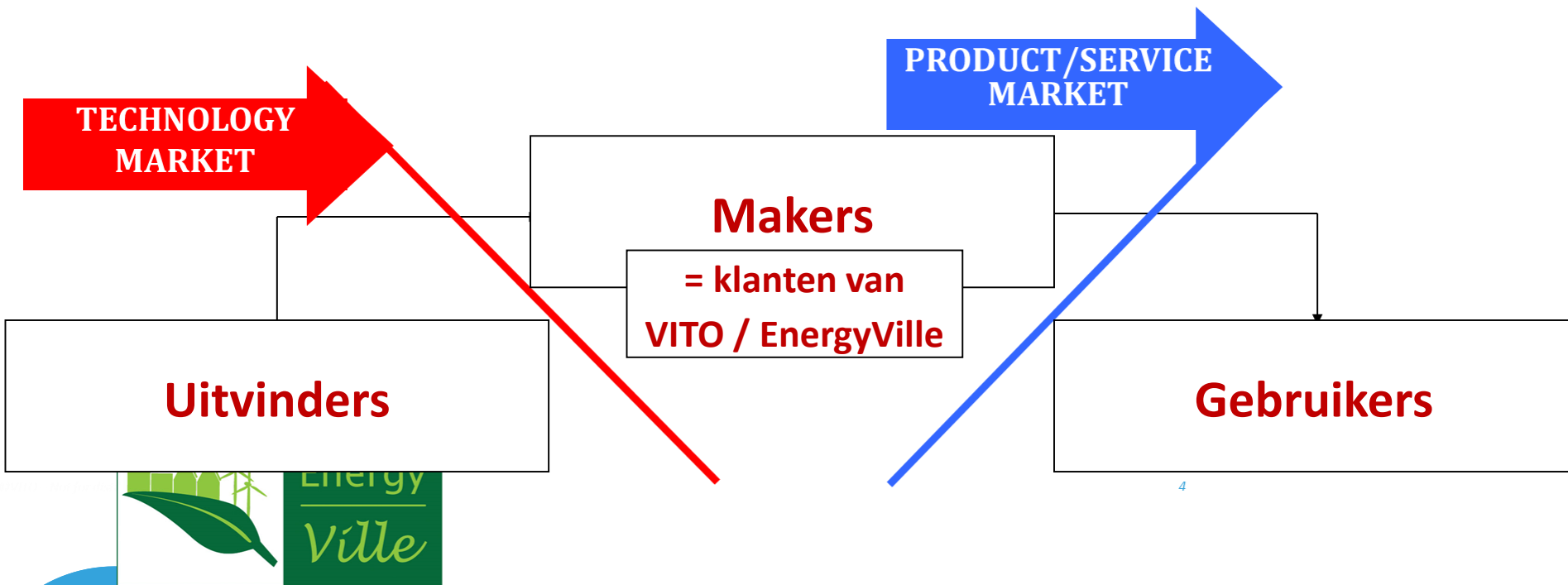
Vanuit het standpunt van een softwarehuis / solution provider

Te vaag? Te duur?
Te traag? Geen afwerking?
Competitie voor onze R&D?
Onzeker/hog risico?
Niet bewezen, niet getest?
Geen continuïteit?
Geen markt? Geen business case?
Word ik ontzorgd?

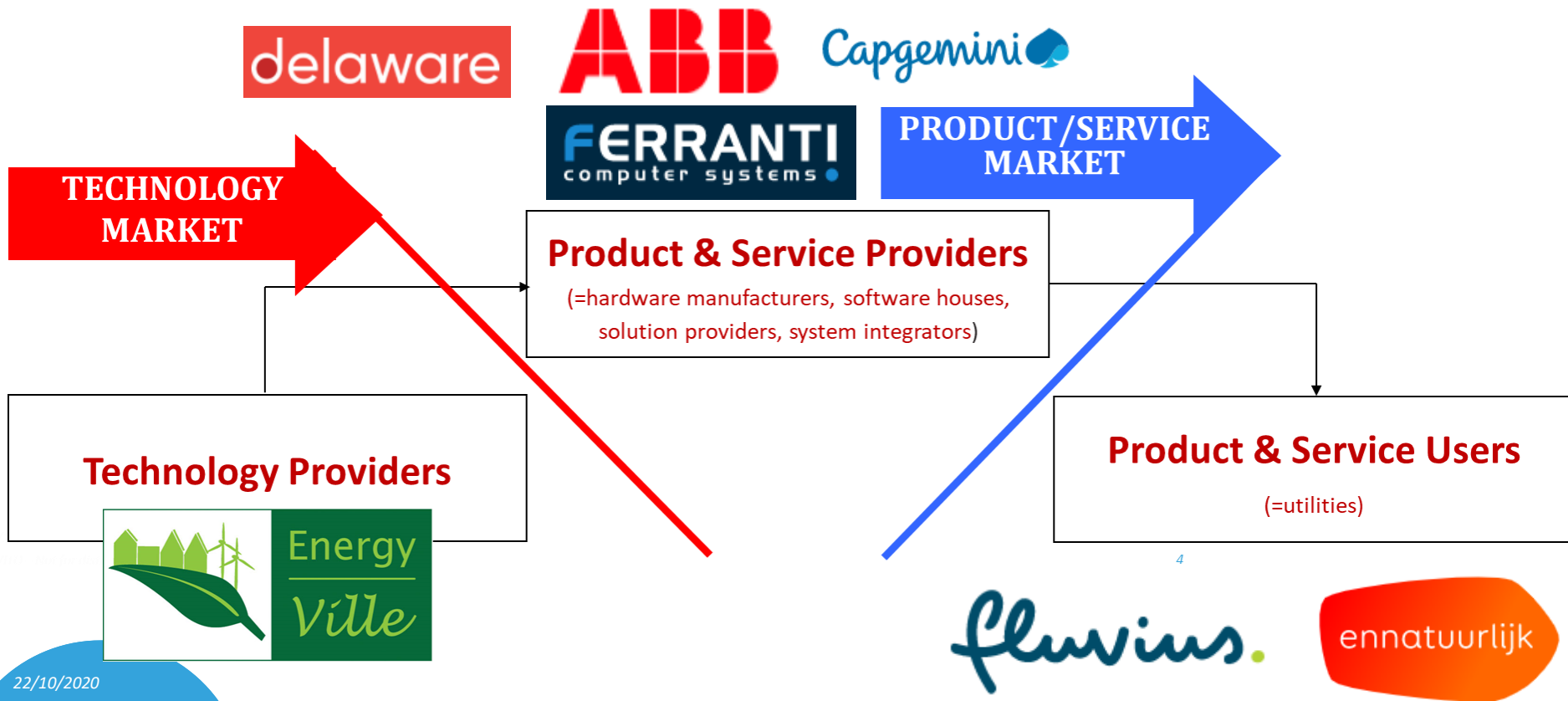
Wij gaan dit omgemak wegnemen



WIE IS KLANT VAN WIE? (B2B)



WIE IS KLANT VAN WIE? (B2B)



REGIONAL INSIGHTS



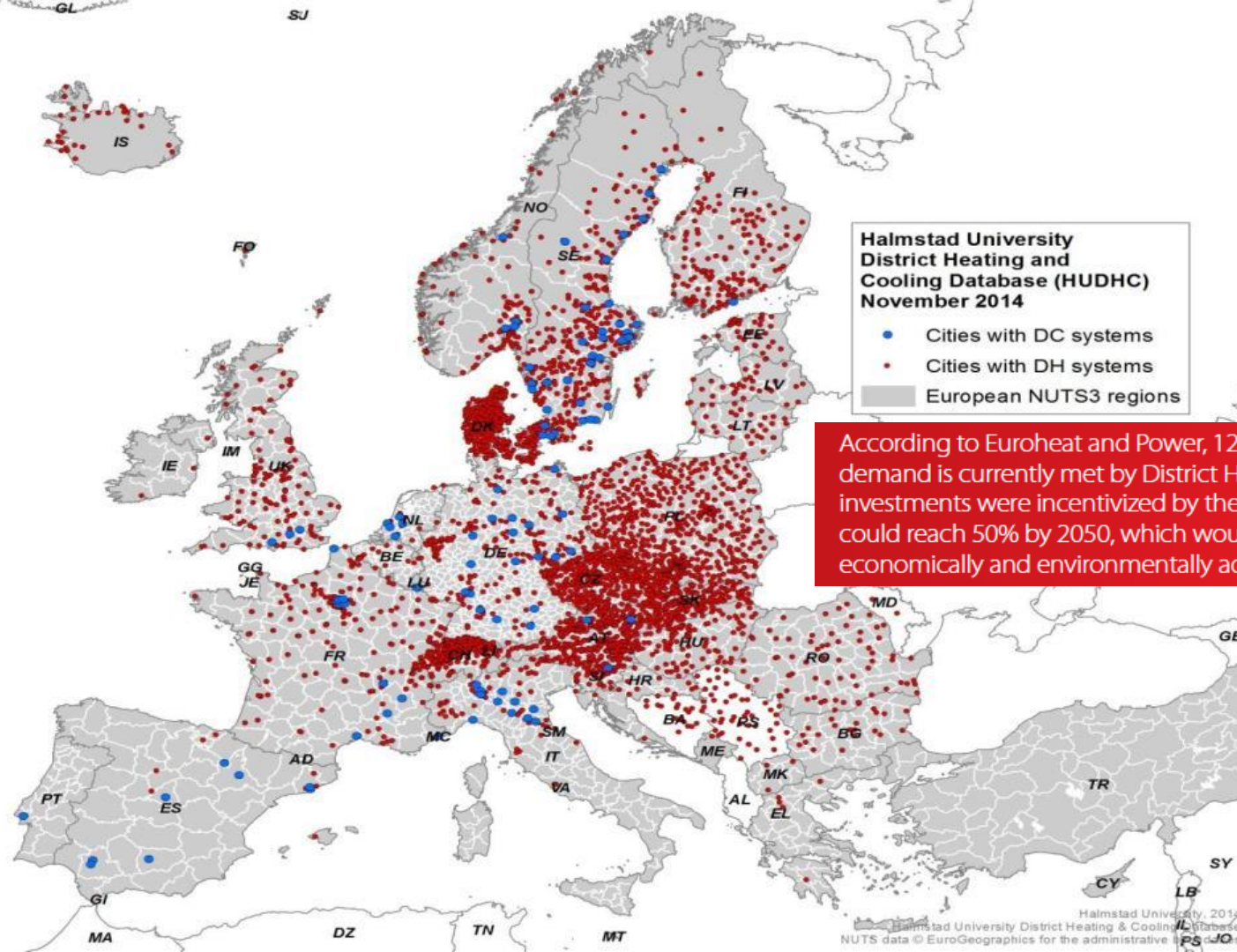
Annual energy consumption
by 2024: **>19,000 PJ**

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

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

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





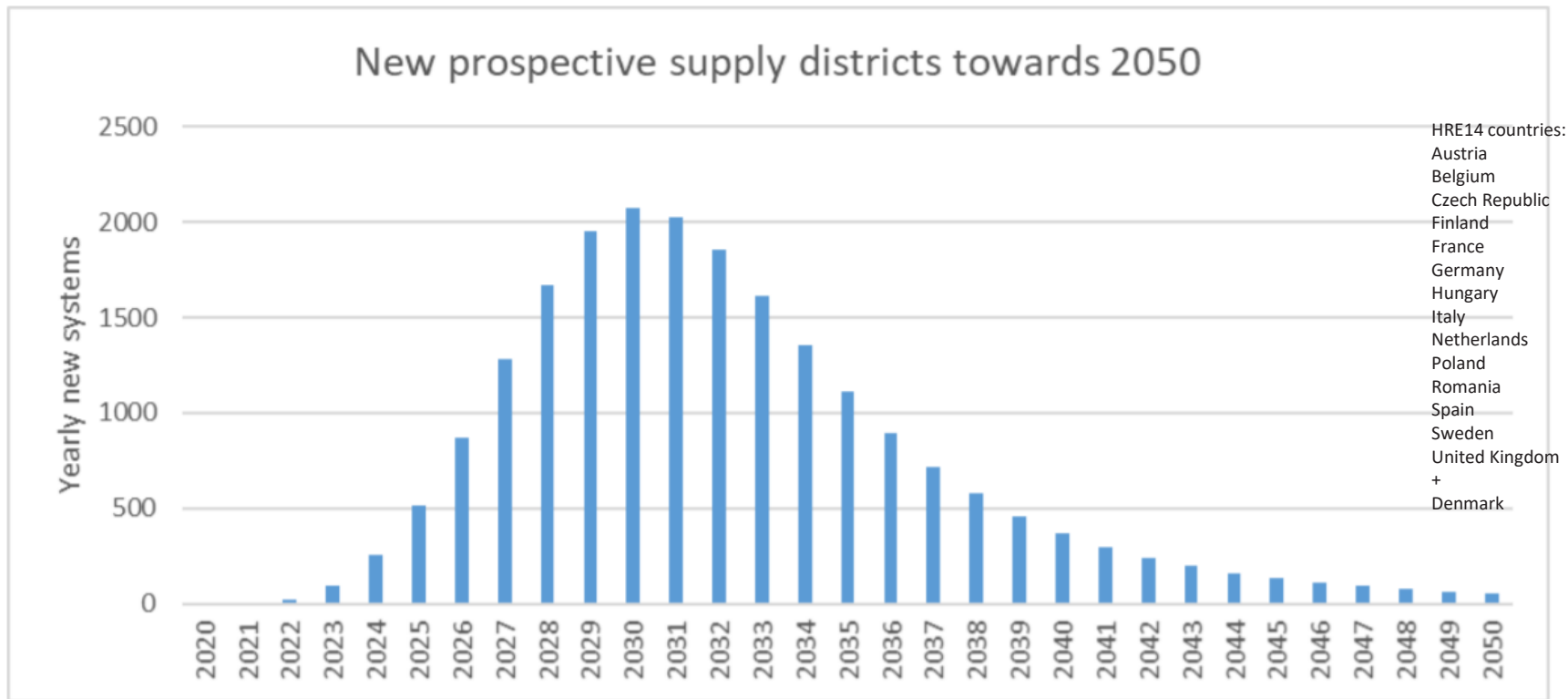


Figure 5-3. Approximate newly established and total amount of district heating systems in HRE14 and Denmark needed for fulfilling the potential of distribution grid investments below 4 EUR/GJ. $X50 = 2030$, $m = 4$.

HOE GAAN WIJ JE KUNNEN HELPEN?



Betrouwbaarheid



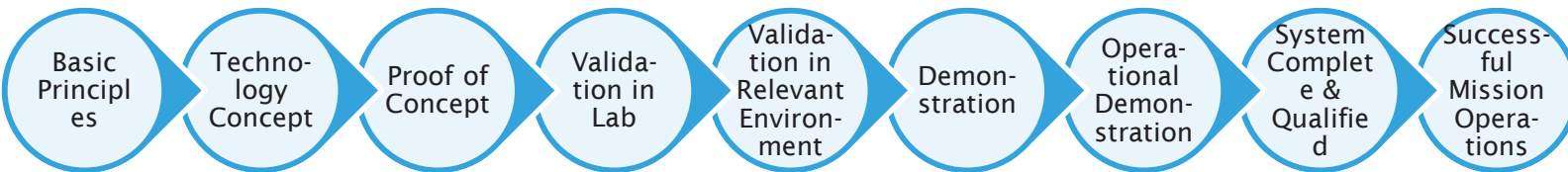
Snelheid van ontwikkeling

Winstgevendheid

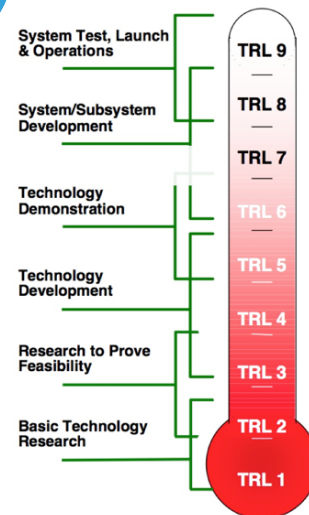


TECHNOLOGY READINESS LEVEL (TRL)

TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
basic principles observed	technology concept formulated	experimental proof of concept	technology validated in lab	technology validated in relevant environment	technology demonstrated in relevant environment	system prototype demonstration in operational environment	system complete and qualified	actual system proven in operational environment



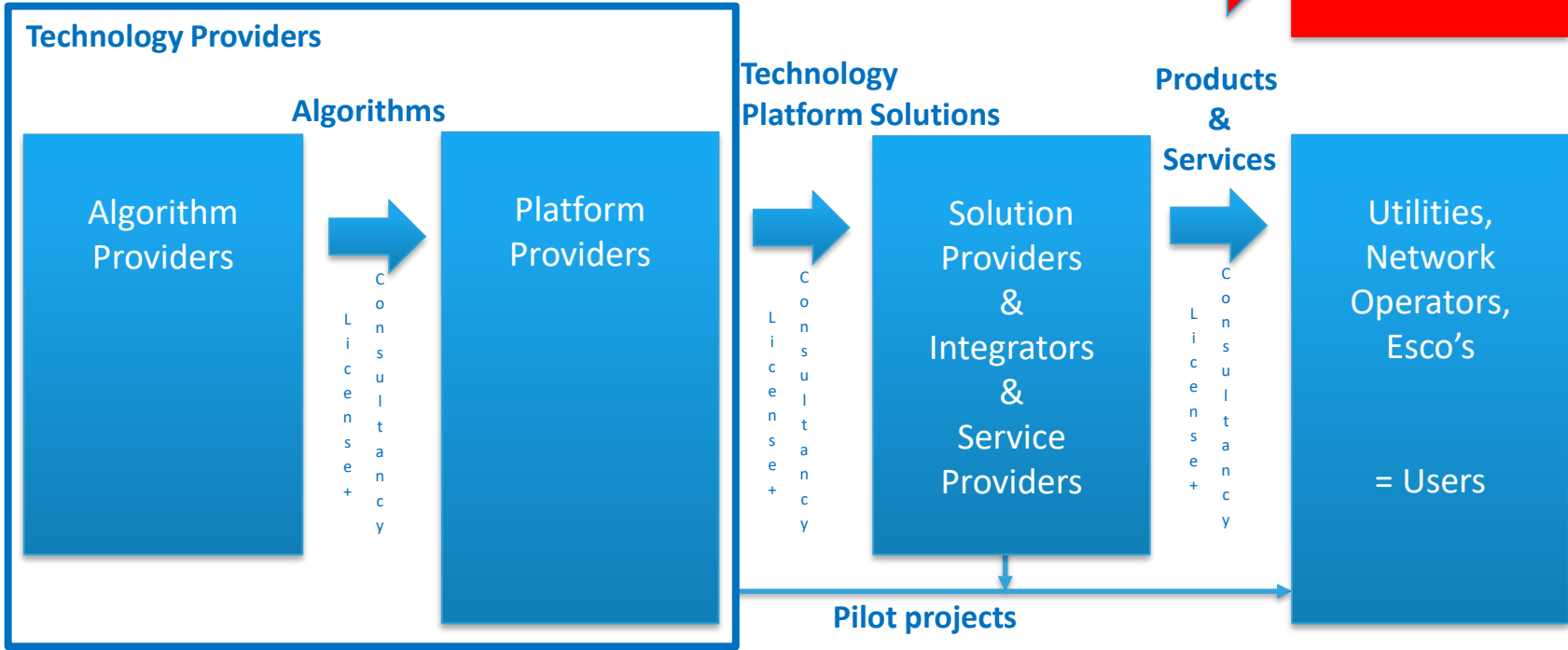
TRL Levels definitions



- TRL9 System ready for full scale deployment*
- TRL8 System incorporated in commercial design*
- TRL7 Integrated pilot system demonstrated*
- TRL6 Prototype system verified*
- TRL5 Laboratory testing of integrated system*
- TRL4 Laboratory testing of prototype component or process*
- TRL3 Critical function, proof of concept established*
- TRL2 Technology concept and/or application formulated*
- TRL1 Basic principles are observed and reported*

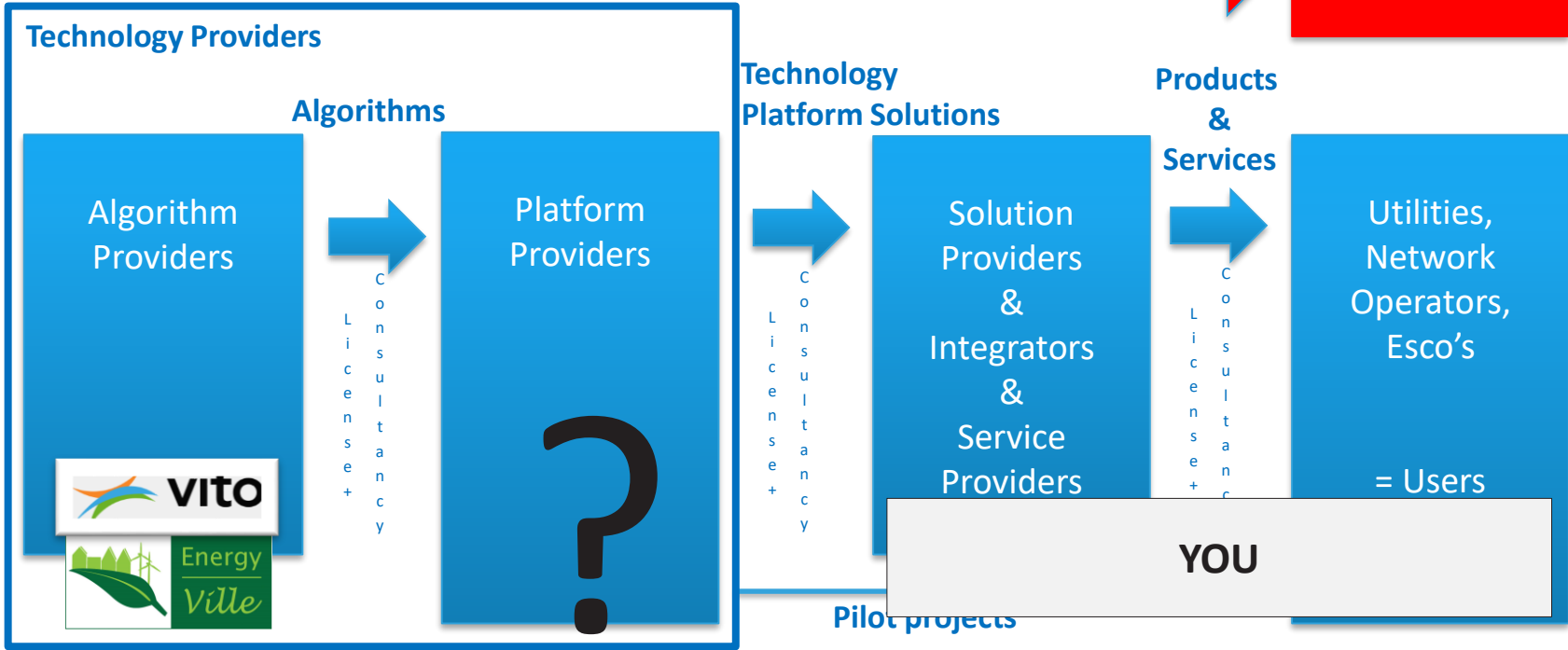
Marktrollen en positionering VITO / EnergyVille

Hoe dichterbij de markt hoe groter de toegevoegde waarde !!!



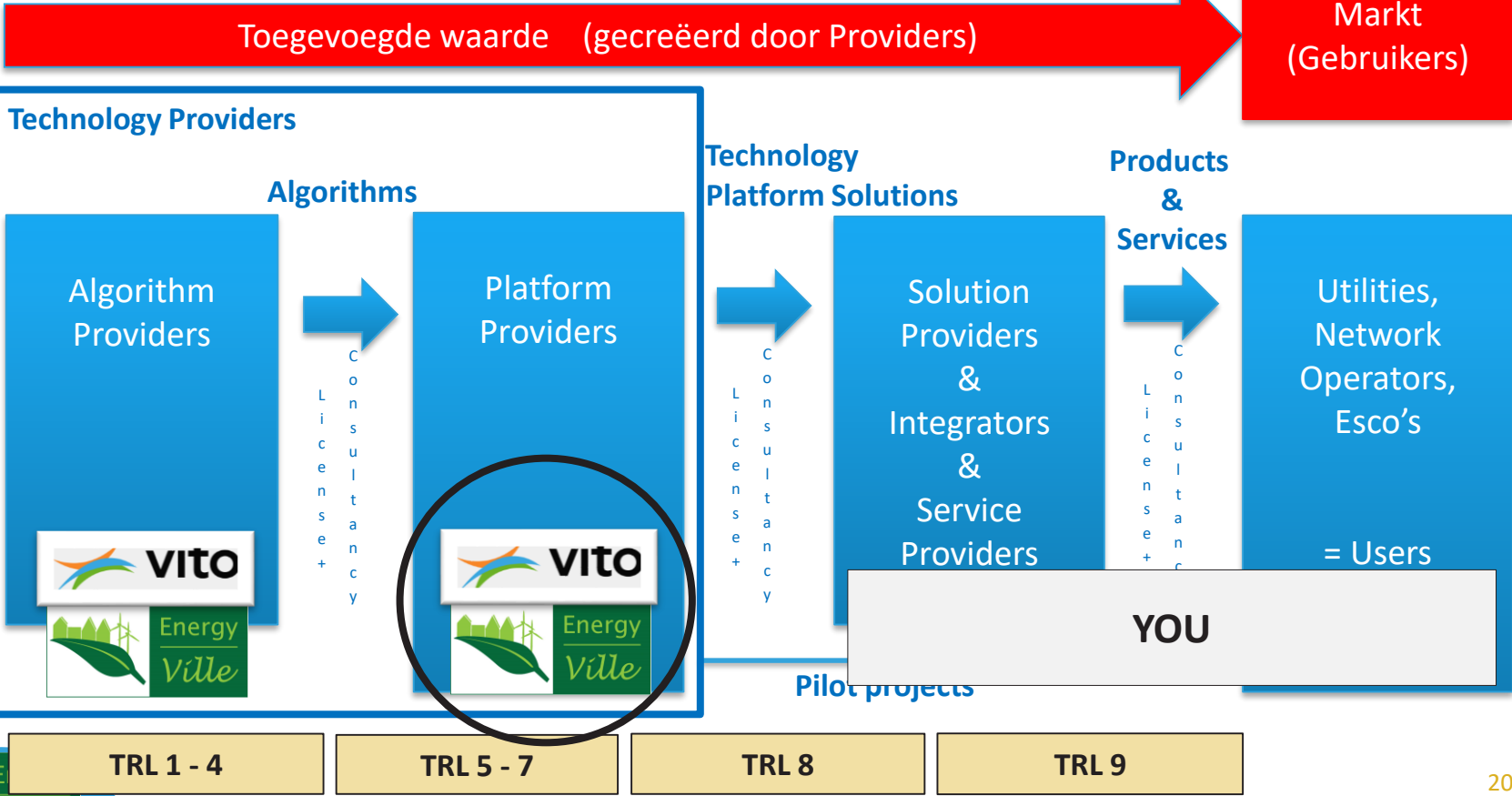
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Markttrollen en positionering VITO / EnergyVille

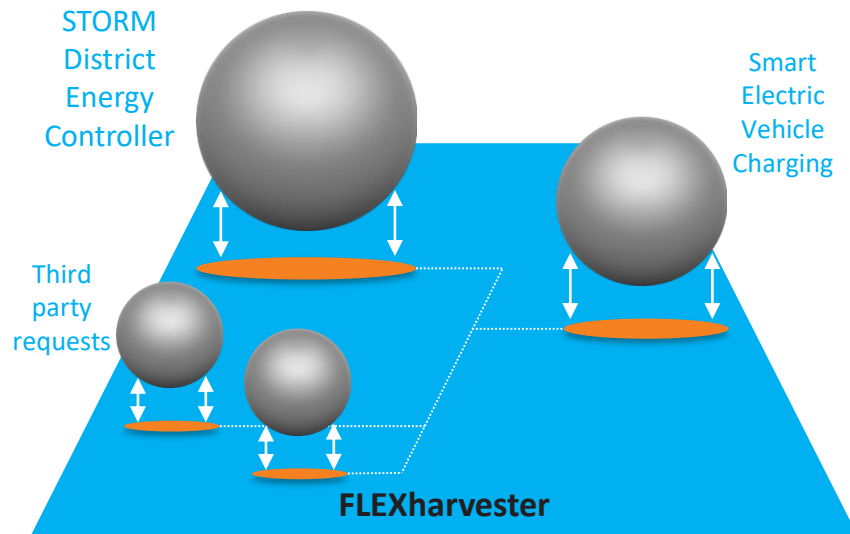
Hoe dichterbij de markt hoe groter de toegevoegde waarde !!!



FLEXharvester is een data storage, management en visualisatie **platform** voor alle energieflexibiliteitsapplicaties ontwikkeld door VITO / EnergyVille.

- Geënt op **Microsoft Azure** cloud
 - Repliceerbare **ARM template** met componenten zoals data storage, IoT hub, pre-processing Alert management, configuratie, visualisatie
- => We leveren het solution design, de architectuur van de solution en de **blueprint**

STORM District Energy Controller is de eerste applicatie gebouwd op het FLEXharvester platform.



TECHNOLOGIE ARCHITECTUUR

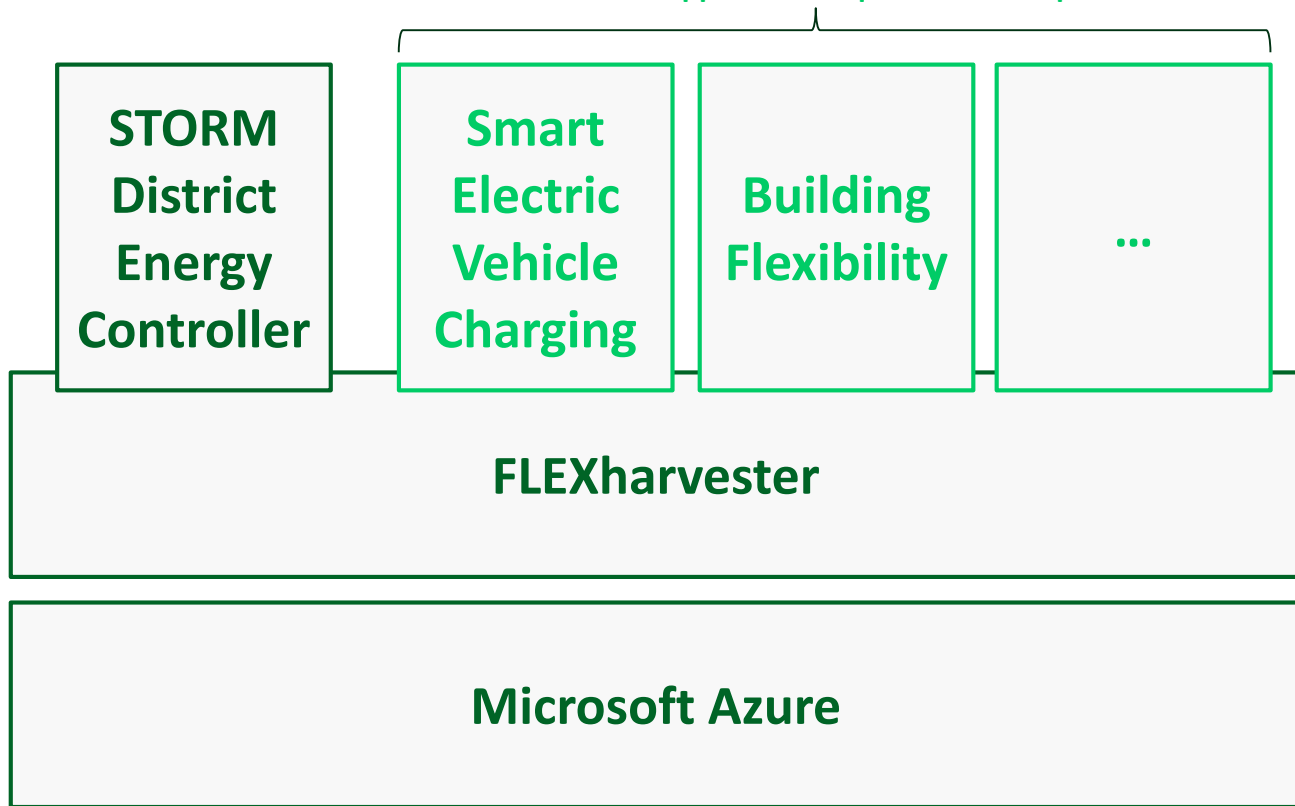
Applicaties
= waarde voor de gebruiker (utility)

Energy flexibility harvesting platform
= waarde voor de VITO/EnergyVille klant (solution provider/system integrator/service provider)

Cloud platform

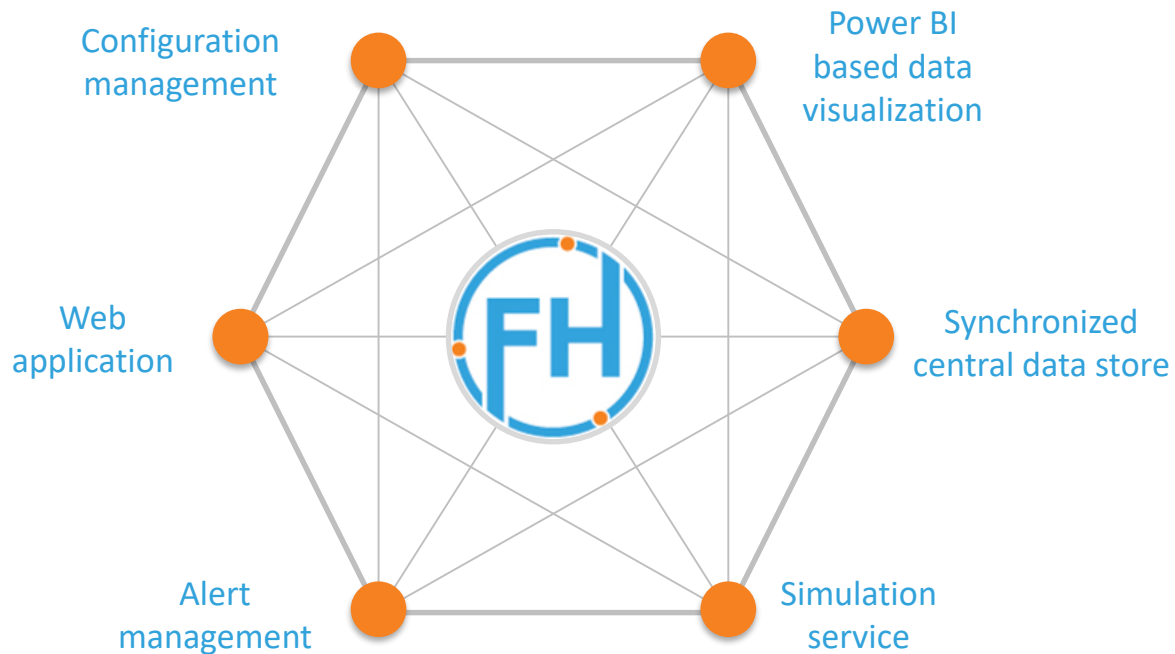
Application requests => uw input is essentieel!

VITO/EnergyVille ambitie: lanceer één nieuwe applicatie per jaar



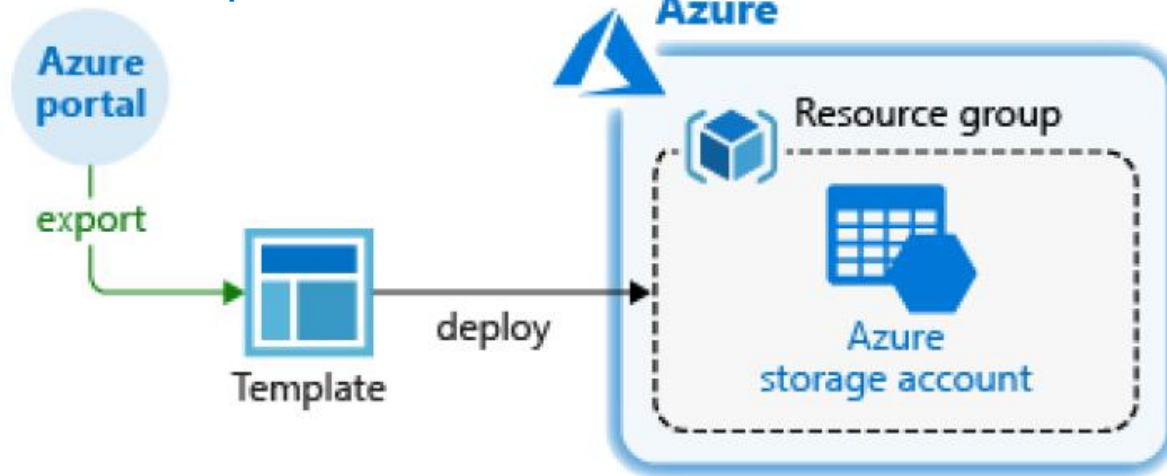
FLEXharvester wordt enkel gelicentieerd inclusief minstens één applicatie.

BELANGRIJKSTE COMPONENTEN



AZURE RESOURCE MANAGER (ARM) TEMPLATE DEPLOYMENT

Microsoft Azure Marketplace



PORTFOLIO / PLANNEN

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

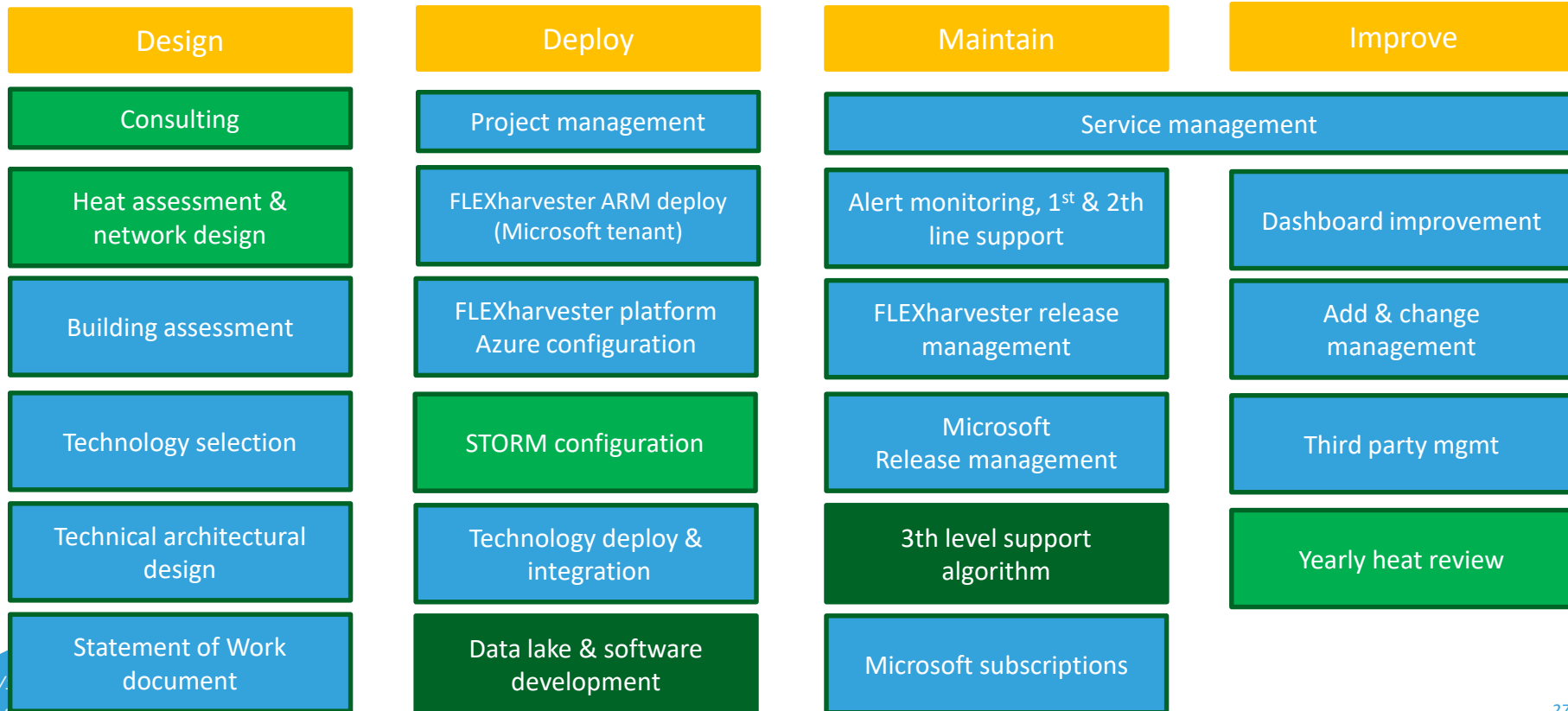
FLEXHARVESTER PILOT

Scope : Projecten als demonstratie of pilootproject, beperkt in de tijd

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 & software development	Microsoft subscriptions	

FLEXHARVESTER SOLUTION

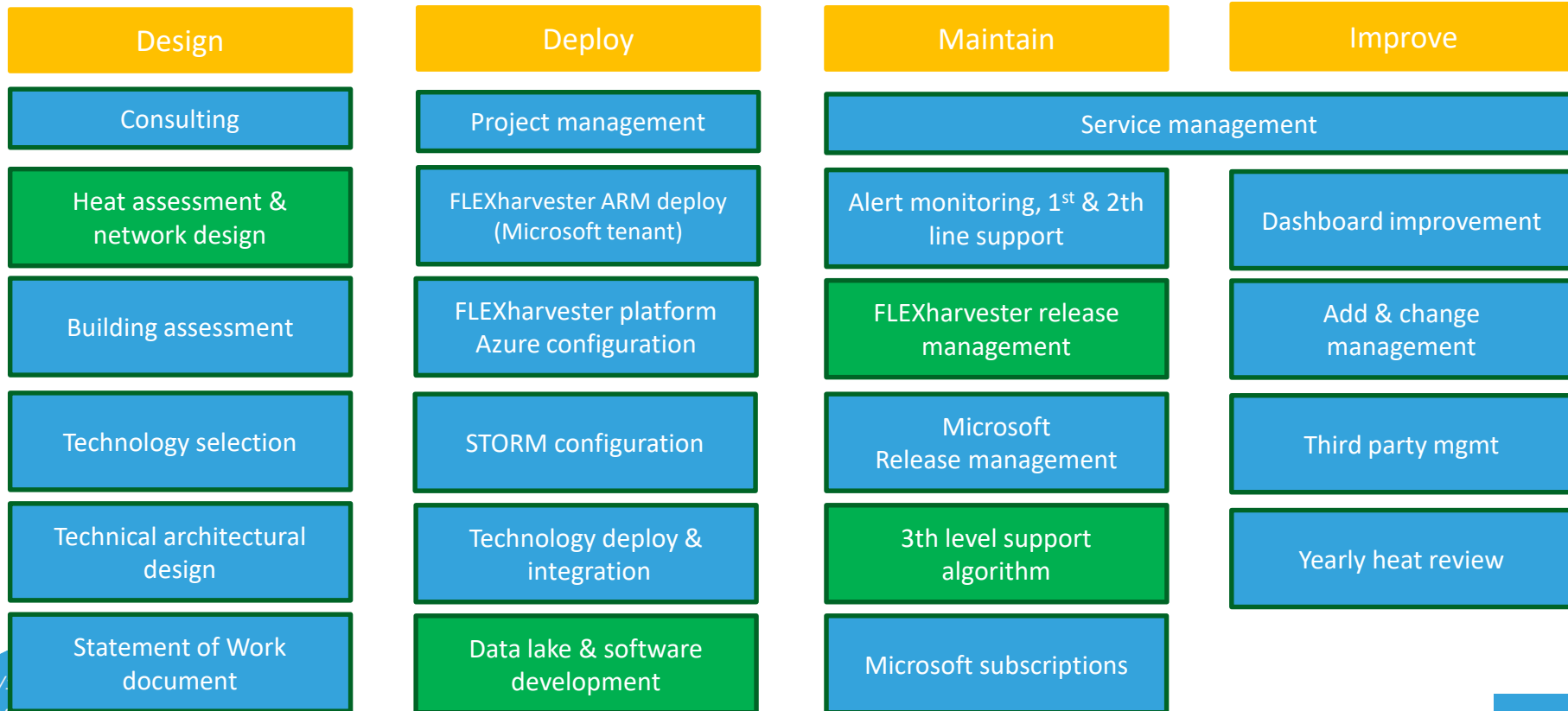
Scope : Integrator/Solution/Service provider bouwt FLEXharvester en VITO/EnergyVille technologie in zijn product/service



FLEXHARVESTER SOLUTION PARTNER MINIMUM VEREISTEN

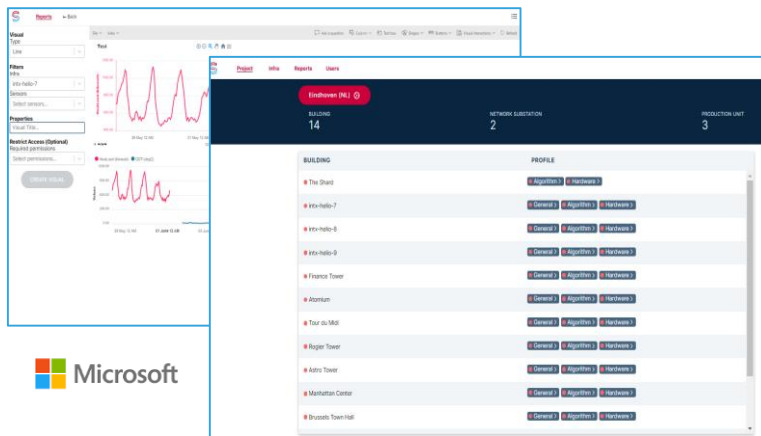
- Project & service management capaciteit
- Microsoft Azure Solution provider
- Technische installatie- en support capaciteit (direct of via onderaanneming)
- Actief in de Energienetwerk management sector

FLEXHARVESTER TECH TRANSFER Scope : Partner beheert het project en de source code zelf, met ondersteuning door VITO



FLEXHARVESTER TECH TRANSFER PARTNER MINIMUM VEREISTEN

- Project & service management capaciteit
- Microsoft Azure Solution provider
- Ontwikkelcapaciteit in Microsoft Azure en Python
- Capaciteit om de algoritmes te begrijpen, integreren en aan te passen
- Warmtenet consulting en management services
- Technische installatie en support capaciteit (direct of via onderaanneming)



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

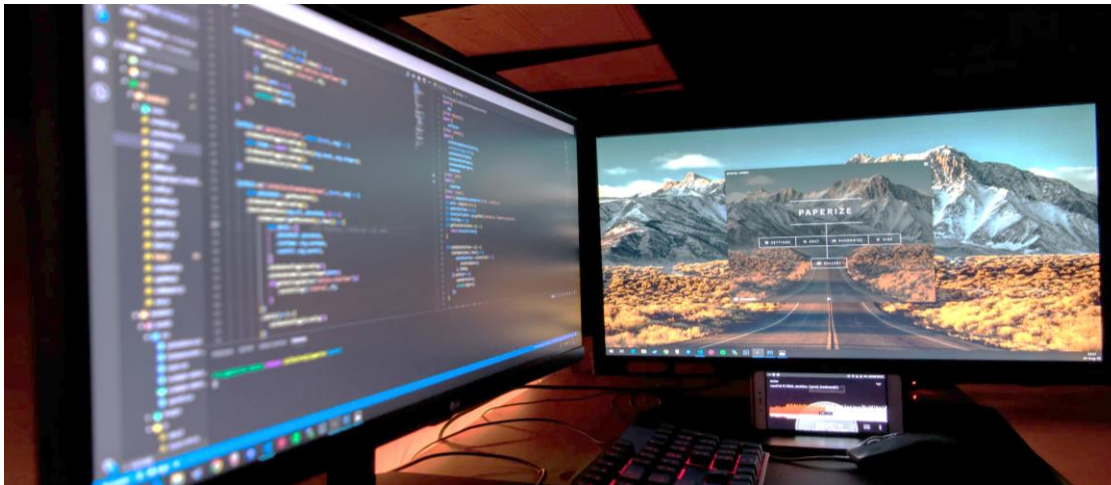
The **FLEXharvester** software components allow integrators, network operators, building management system providers and real estate companies to **enhance** their project **right away** with the **STORM District Energy Controller** for flexibility management and demand response capabilities.

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.

WAT IS FLEXHARVESTER?

Open energy flexibility platform

1

Energieflexibiliteit

FLEXharvester is een gemakkelijk porteerbaar open data model en architectuur voor het bouwen van oplossingen voor het beheer van energieflexibiliteit.

2

Technologiestandaarden

FLEXharvester is ontwikkeld op basis van marktstandaarden zoals Microsoft Azure, Microsoft IoT Hub, Microsoft Power BI en Python.

3

Open framework

FLEXharvester is open voor integratie met elke andere technologie of applicatie via API's of andere platformen.

4

Partner ecosysteem

FLEXharvester biedt een ecosysteem aan van technologiepartners die zijn open data model en architectuur ondersteunen.

5

Smart solutions

VITO/EnergyVille stelt een uitgebreide suite van slimme flexibiliteits-toepassingen op FLEXharvester voor die de TCO verlagen en de activering in de markt versnellen.

Wat bieden wij

Vertrouwd platform/tools

Behapbare expertise

Winstgevendheid

Kortere inwerktijd

Kortere go to market

Innovatie

Duurzaamheid

Betrouwbaarheid

Vertrouwen



FLEXharvester helpt systeemintegratoren en softwarehuizen om op een vertrouwde manier hun klanten - netwerk operators, esco's en local energy communities – te bedienen met energieflexibiliteitsoplossingen.

Op een gestandaardiseerde omgeving, met bewezen technologie, voor een versnelde marktintroductie.

WAT BETEKEN FLEXHARVESTER VOOR JOU?



Marktklare innovatie



Betrouwbaarheid



Winstgevendheid



Snelheid van ontwikkeling

UITNODIGING

- Wij nodigen **solution providers** uit als partners voor het maken van producten en diensten uit VITO/EnergyVille's technologie op het FLEXharvester platform
- Wij nodigen **utilities en steden en gemeenten** uit om mee te stappen in onze energieflexibiliteit pilootprojecten, en de toegevoegde waarde aan te tonen
- Wij nodigen **iedereen** uit om deel uit te maken van het ecosysteem en input te leveren: welke van uw energie- en duurzaamheidsvraagstukken kunnen wij samen oplossen met onze huidige en toekomstige technologie?

Login in onze **FLEX**harvester ARM demo

Bezoek de Microsoft Azure Marketplace :

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

Bel ons voor meer informatie: +32 492 977 923

Email ons: erik.deschutter@energyville.be

Meer info: www.flexharvester.com

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

