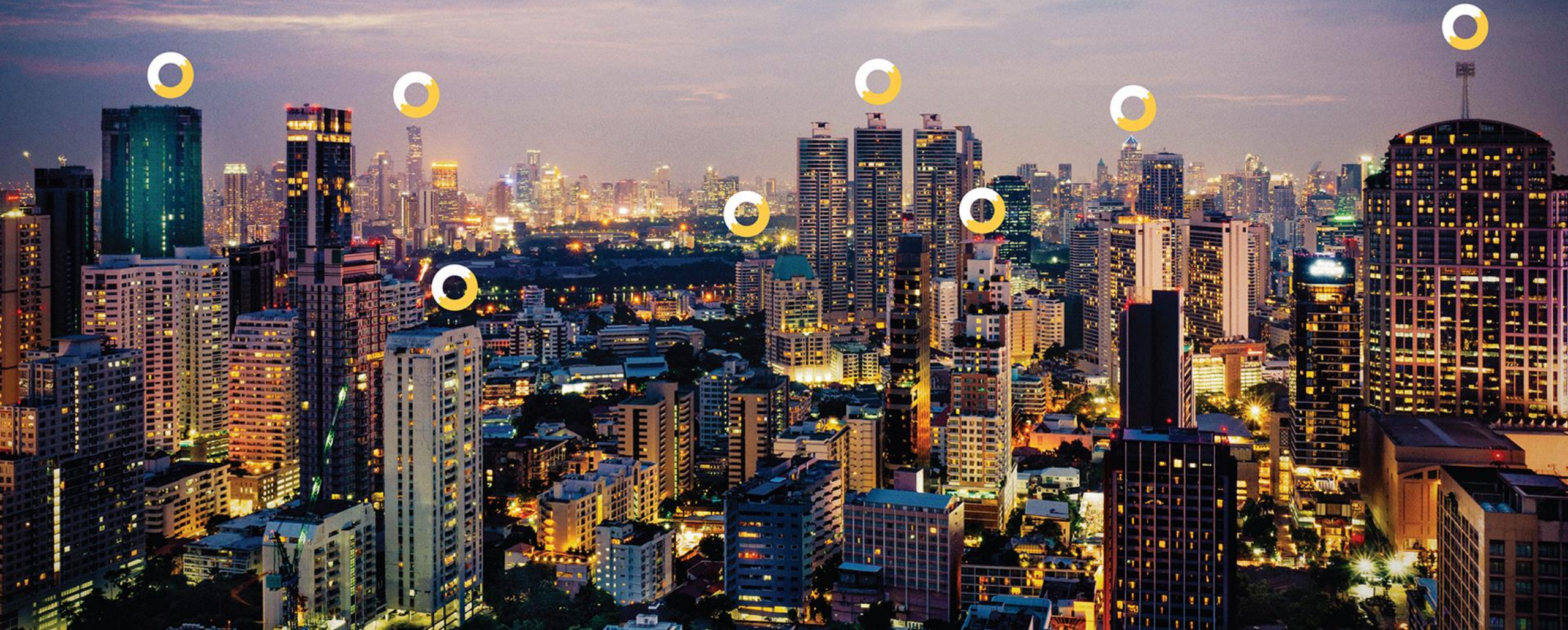# interconnect

interoperable solutions
connecting smart homes,
buildings and grids

WP 6
Task 6.2.3
Deliverable 6.9 V3

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Introduction

- This document is a third in a series of 10 documents that will be used to follow-up pilot activities and to assess their status within WP6 .

- Updates will be provided in:

    - M21: Evaluation period Apr. 2021 to Jun. 2021 – Expected delivery (Jul. 2021) – D6.8

    - M24: Evaluation period Jul. 2021 to Sep. 2021 – Expected delivery (Oct. 2021) – D6.9 – This document

    - M27: Evaluation period Oct. 2021 to Dec. 2021 – Expected delivery (Jan. 2022)

    - M30: Evaluation period Jan. 2022 to Mar. 2022 – Expected delivery (Apr. 2022)

    - M33: Evaluation period Apr. 2022 to Jun. 2022 – Expected delivery (Jul. 2022)

    - M36: Evaluation period Jul. 2022 to Sep. 2022 – Expected delivery (Oct. 2022)

    - M39: Evaluation period Oct. 2022 to Dec. 2022 – Expected delivery (Jan. 2023)

    - M42: Evaluation period Jan. 2023 to Mar. 2023 – Expected delivery (Apr. 2023)

    - M45: Evaluation period Apr. 2023 to Jun 2023 – Expected delivery (Jul. 2023)

    - M48: Evaluation period Jul. 2023 to Sep 2023 – Expected delivery (Oct. 2023)

- These deliverables are complementary to deliverables 6.1 to 6.7, where the performance and the impact on the various KPI's will be discussed in more detail.

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Pilot List

- **15 Pilots, 7 Countries:**

  I. **Belgium**:
    BE 01 Antwerp - Student Dormitory
    BE 02 Genk - ThermoVault
    BE 03 Genk - Thorpark
    BE 04 Gent - Nieuwe Dokken
    BE 05 Hasselt - Cordium
    BE 06 Kobbegem - Nanogrid
    BE 07 Vinkenbos - 3E
    BE 08 Zellik - Green Energy Park

  II. **France**:   FR 01 - Toulon

  III. **Germany**:
    DE 01 - Hamburg
    DE 02 - Norderstedt

  IV. **Greece**:   GR 01 - Volos
  V. **Italy**:   IT 01 - Milano
  VI. **Portugal**:   PT 01 - Portugal
  VII. **Netherlands**:   NL 01 – Eindhoven
  VIII. **Overarching Pilot:**   OV 01 - Cybergrid

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Summary

- This deliverable is a collection of the progress reports of all the pilots. The following deliverable, D6.10 is planned for M27 (Jan. 2022)

- Most pilots are ready to include the first whitegoods and start implementing the Interoperability Framework. The distribution of the whitegood devices has suffered a delay due to COVID: there is a global shortage of microchips, which generates a production reduction and a supply delay of several months.

- The Pilot Monitoring Plan has been drafted and shared for comments by the pilots. This plan is demonstrated in the following slides.

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Monitoring Plan DRAFT

- One spreadsheet, to be kept online on the shared project drive;

- One sheet per pilot;

- One sheet with KPI overview as reference;

- Each pilot can fill in the results at their own discretion before each reporting deadline.

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Monitoring Plan DRAFT Extract

- Each pilot will be able to report on each KPI;
- Some KPIs are compulsory;
- Others are to be chosen by the pilot;
- Some KPIs are not measured by the pilots, but still need to be reported;

Pilot BE.01 Overall Results

KPI Group	KPI Nr	Description	Input	Target	Actual	Comments
INTEROPERABILITY	INT 2	# services registered in the Service Store of Interconnect, developed/ adapted as result of open calls	Services	0	0	
			Devices	0	0	
			Apps	0	0	
INTEROPERABILITY	INT 3	# Instances/runtimes per service	Services	0	0	
			Devices	0	0	
			Apps	0	0	
INTEROPERABILITY	INT 4	# Instances/runtimes of the interoperability layer	HEMS	0	0	
			BMS	0	0	
			SCEMS	0	0	
INTEROPERABILITY	INT 5	# services per instance for each instance with an interoperability layer		0	0	
INTEROPERABILITY	INT 6	# messages and datapackets per service		0	0	
INTEROPERABILITY	INT 7	# DSO adopting the standardized interface		0	0	
INTEROPERABILITY	INT 8	# flexibility platforms interfacing with DSO legacy systems (to stay in sync with the SCADA legacy terminology)		0	0	
INTEROPERABILITY	INT 9	# flexibility platforms interfacing with grid (congestion) related (DSO mimicked) systems		0	0	

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Pilot BE.01

Pilot ID	BE.01
Pilot Name	Antwerp - imec
Pilot Responsible	esteban.municio@imec.be

Work progress details	Next steps
• Testing and deployment of energy monitoring sensors (current clamps) • Pilot configuration planning and coordination among partners • Discussions on the integration of the DYAMAND platform with the IC Interoperable layer	• Complete monitoring deployment and start recording benchmarking data • Installation of appliances, when available • Start gamification approach after summer 2022 (approx.)

Risks	Mitigations
• Benchmarking Dataset Size too small • Delay because of bureaucracy procedures with the University of Antwerp (data management, devices' billing, connectivity provision, etc.) • Delay in delivery of devices • Service Specific Adapters not available on time • Problems with operational aspects of the Interoperability Layer like stability, performance, security,… • Low engagement from students in the pilot	• Start monitoring phase as soon as possible • Start early with communication and organisation of appliances delivery • Continue with good communication with the University of Antwerp • Follow up with the manufacturers, make sure the pilot can operate without the devices. • Pre-testing of services' interaction without performing real command actions should discover potential operational Interoperability Layer flaws before the pilot site goes operational • Involve the university to make the participation in the pilot more attractive (e.g., marketing, free laundry, etc.)

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Pilot BE.02

Pilot ID	BE.02
Pilot Name	Genk - ThermoVault
Pilot Responsible	pau.lloret@thermovault.com

Work progress details

- Design of the interconnected services
- Review of the EEBUS protocol
- Pilot configuration planning and coordination among partners
- Improvement of the control algorithms for LECs

Next steps

- Heat pumps control development based on EEBUS parameters
- Integration of additional services and SSAs
- Installation of appliances, when available
- Tests of the setup with live data

Risks

- Mismatch in logistics of charging points, heat pumps and whitegoods delivery vs. inhabitant arrival
- Whitegoods, charging points and heat pumps availability in the project
- Delay in delivery of devices
- Service Specific Adapters not available on time
- Problems with operational aspects of the Interoperability Layer like stability, performance, security,…
- Pilot site (outside IC project) decisions could retard the setup: charging points, heat pumps and whitegoods

Mitigations

- Start early with communication and organisation of appliances delivery
- Continue with good communication between pilot partners
- Create a step-by-step integration process of the services and complexity
- Follow up with the manufacturers, make sure the pilot can operate without the devices.
- Pre-testing of services' interaction without performing real command actions should discover potential operational Interoperability Layer flaws before the pilot site goes operational.
- Partial tests can be started in case not all SSAs are on time.
- Pilot configuration uncertainty: create as much as possible a generic and flexible setup so changes in the pilot configuration can be handled easily.

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Pilot BE.03

Pilot ID	BE 03
Pilot Name	Genk - Thor park
Pilot Responsible	dominic.ectors@vito.be

Work progress details

- EV smart charging data is collected via Azure EV smart charging platform
- EnergyVille building data is collected via Azure SmarThor platform
- Work in parallel has started to migrate both platforms to a generic Azure based data capturing platform.
- Initial service tests for EV smart charging, with fixed (not from a device or service) data for some of the underlying services have been done
- Implementation of the service specific adapters (see WP3 status) going on
- Day ahead price -remote- service test via the interoperability framework

Next steps

- Installation of additional EV smart chargers
- Integration of additional services and SSAs
- Setting up multiple KERs
- Installation of whitegoods, when available, in the EnergyVille lab
- Day ahead price -local- service test via the interoperability framework
- Tests of the setup with live data

Risks

- Problems with operational aspects of the Interoperability Layer like stability, performance, security,…
- Service Specific Adapters not available on time
- Whitegoods availability in the project (for the lab)

Mitigations

- Pre-testing of services' interaction without performing real command actions should discover potential operational Interoperability Layer flaws before the pilot site goes operational.
- Partial tests can be started in case not all SSAs are on time.

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Pilot BE.04

Pilot ID	BE.04
Pilot Name	De Nieuwe Dokken
Pilot Responsible	Chaim.de.mulder@openmotics.com

Work progress details

- Daily follow-up of finished first building phase (approx. 100 living units): data acquisition for district-level and private-level assets.
- Planning and starting of next building phase (communication infrastructure, district heating piping, electrical equipment, assessing possibilities for building-integrated PV)
- Operational analysis of district heating network
- Service Specific Adapter implementation for all registered services close to finished

Next steps

- Continue follow-up of ongoing building phase (addition of 125 living units)
- Optimal control of district heating network
- Organise delivery and installation of whitegoods
- Make and execute planning for integration of whitegoods based on SAREF

Risks

- Mismatch in logistics of white goods delivery vs. inhabitant arrival
- Delays in building progress (decision making, deliveries, unexpected cirumstances…)

Mitigations

- Start early (i.e. now) with communication and organisation of whitegood delivery
- Continue with good communication between pilot partners

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Pilot BE.05

Pilot ID	BE 05
Pilot Name	Hasselt Cordium
Pilot Responsible	dominic.ectors@vito.be

Work progress details	Next steps
• Pilot site data is being collected via the Azure based data capturing platform. • Implementation of the service specific adapters (see WP3 status) going on • Day ahead price -remote- service test via the interoperability framework	• Connecting the data capturing platform and the application platform (BEMS/DEMS) • Integration of additional services and SSAs • Setting up multiple KERs • Installation of whitegoods, when available. Recruit residents. Handle resident consents.

Risks	Mitigations

• Operational aspects of the Interoperability Layer like stability, performance, security,…
• Availability of Service Specific Adapters on time
• Whitegoods availability in the project
• Pilot site (outside IC project) decisions could retard the setup:
  • discussion ongoing on PV versus PV-T (large installation cost)
  • Wind turbine on the roof (only one, poor support from supplier)
	• Pre-testing of services' interaction without performing real command actions should discover potential operational Interoperability Layer flaws before the pilot site goes operational.
	• Partial tests can be started in case not all SSAs are on time.
	• If no whitegoods will be available, additional effort to promote the project towards residents may be needed.
	• Pilot configuration uncertainty: create as much as possible a generic and flexible setup so changes in the pilot configuration can be handled easily.

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Pilot BE.06

Pilot ID	BE.07
Pilot Name	Nanogrid
Pilot Responsible	Arnor@think-e.be

Work progress details	Next steps
• Initial deployment of energy monitoring sensors • Improvement of the control algorithms for LECs	• Start recording benchmarking data • Organise delivery and installation of whitegoods • the Integration of additional services

Risks	Mitigations
• Mismatch in logistics of whitegoods delivery • Availability of Service Specific Adapters on time • Operational aspects of the Interoperability Layer like stability, performance, security,…	• Start early (i.e. now) with organisation of white good delivery, If no whitegoods will be available, alternative devices will be used to demonstrate the pilot operation • Partial tests can be started in case not all SSAs are on time. • Pre-testing of services' interaction without performing real command actions should discover potential operational Interoperability Layer flaws before the pilot site goes operational.

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Pilot BE.07

Pilot ID	BE.06
Pilot Name	Vinkenbosch
Pilot Responsible	mel@3e.eu

Work progress details

- Early adoption and examination of GA and IF for information exchange together with CyberGrid
- Creation of explicit flexibility SSA backend and related graph pattern in WP3
- Providing expert services in T5.4 on the P2P trading implementation
- Contributing in WP4 on the DSO interface to the IF,
- Changing the pilot (due to the investment need by the partners) to Vinkenbosch: +- 200 kWp PV last year and expect to have 30% injection (60.000 kWh), Remotely controllable Heat pumps, 630 kVA 10KV grid connection
- Provision of the requested inputs for the Exploitation plan
- Reporting to the project Consortium

Next steps

- Progressing on finalizing the flexibility SSA integration into the pilot
- Finalizing the integration of Asset Flexibility Module of SynaptiQ for the pilot
- Further contribution in WP4 as requested by the leaders
- Updating the project consortium about the new pilot selection
- Kick-off and regular meetings with the new pilot owner
- Installation of the SynaptiQ platform for baseline monitoring in the pilot
- introducing the new partner Wattson as the ESCO and the intermediate person by the pilot owner
- Facilitation of ABB charging stations installation and integration via SynaptiQ
- Integration of the pilot HVAC system into the monitoring platform

Risks

- Blocking point is still the availability of ontologies and then, a ready to plug-in IF.
- Delay in delivery of devices and re-initiation of the new pilot
- No supplier, DSO and TSO are present in comparison with a real electricity ecosystem; Regulatory context and lack of local flexibility markets may be limiting.
- Communication interfaces for local monitoring and control are not adopting the IF. Compatibility issues may happen.
- Partners do not follow the training schedule but invent new content

Mitigations

- Closer collaboration of WP4, WP3, WP2, and WP5 together with the IF adopters
- Follow-up with the manufacturers, confirm that the pilot implementation evolves even if lacking the devices
- A regulatory framework surrounding citizen energy communities and collective self-consumption will be made available by CyberGrid
- Regular meetings to improve performance and update partners

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Pilot BE.08 Zellik

Pilot ID	BE.08
Pilot Name	Zellik
Pilot Responsible	walter.brosius@vub.be

Work progress details

- The Smart Village Lab, containing the 6 virtual houses for the pilot are under construction
- Grand opening is planned for mid-November.
- HEMS selection has narrowed down to the HEMS of Interconnect partner Openmotics
- P2P energy trading marketplace is being defined in cooperation with WP5

Next steps

- Finish the construction of the smart village lab
- Install the HEMS prior for initial testing
- Regular workshops with WP5 for the P2P marketplace

Risks

- Lack of SSA's for the required HEMS and services
- Delay in delivery of devices

Mitigations

- Create a step-by-step integration process of the services and complexity. Choose one HEMS to start with and leverage the expertise of the partner
- Follow up with the manufacturers, make sure the pilot can operate without the devices.

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Pilot DE.01

Pilot ID	DE.01
Pilot Name	Hamburg
Pilot Responsible	fischedick@keo-connectivity.de

Work progress details	Next steps
• SW development on Theben SMGW Added Value Module is ongoing. First Version of Software will be finalized within next 2 weeks. • SSA for LPC, MGCP and TOUT are realized and tested against Service from Fraunhofer IEE and Uni Kassel • MQTT Broker realization on SNH side in progress • Realisation of Pilot locations (Hotels) contracting documents between KEO, Stromnetze Hamburg and Wirelane.	• Test of the Fair Share Algorithm on Added value Module • Testing of the whole communication at SNH Laboratory side

Risks	Mitigations
• Contracting takes too much time. Hotels can't be selected. Services of the Fraunhofer and Uni Kassel depends on Midnet Grid Informationen. Without Hotel location information Services can't be realized, tested and used.	• Preselection of Hotels are ongoing.

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Pilot DE.02: Norderstedt

Pilot ID	DE.02
Pilot Name	Norderstedt
Pilot Responsible	bartsch@eebus.org

Work progress details

- Still in budget clarification for the pilot installation and EEBUS with INESCTEC
- Clarification with gridX the timeline and first integration steps
- First definition of timeline with IVU/MeterPan
- Update the timeline from Vaillant. The dates with the needed use cases are more delayed than expected
- Wirelane update the charging unit product for the Norderstedt pilot
- Integration of SAA for White-Goods cloud services is ongoing together with the partner FH Dortmund, DFKE, BSH, KEO and Miele

Next steps

- Close contract with MeterPan and gridX as fast as possible
- Close the contracts wit the other service partner in Norderstedt
- Organize the delivery
- Define based on the partner information the integration plan for Norderstedt
- Order the two Viessmann inverters for Norderstedt pilot and define the pilot participants for this device
- Define the delivery dates of devices with the pilot partner

Risks

- The smart devices will not have the expected functionality/use cases at pilot start or during the pilot
- We will not find pilot participants for the HVAC installations
- Partner will not sign the contract with given timeline

Mitigations

- Define update strategy based on defined dates
- Still in contact with local HVAC service partner to synchronize the possible participants in Norderstedt

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Pilot GR.01

Pilot ID	GR.01
Pilot Name	Greek Pilot (Athens, Volos, Thessaloniki)
Pilot Responsible	ds@gridnet.gr

Work progress details

- SAREFization process of pilot's services is at its final stages (Most of SSAs ready, Graph patterns are still evolving).
- Engagement of citizens and hardware installations/deployments are ongoing (COSMOTE 20/20 homes, GRIDNET 40/50 homes, HERON 80/200).
- Processing of historical energy consumption data from early installations for training forecasting models.
- Mobile application development still ongoing (in parallel with SAREFization).

Next steps

- Finish graph patterns and remaining SSAs in order to integrate pilot's services.
- Speed up citizens enrolment/engagement and start related activities with task 9.3.
- Work on final definition of pilot's KPIs based on the description of the HLUCs.
- Coordinate on smart-appliances delivery and installation.
- Familiarization with the smart appliances SSA as soon as possible in order to have everything integrated for the HLUCs.

Risks

- Deployment of Project's planned appliances could be affected by shipment delays or covid-19 related delays or users preferences on models.
- Smart-meter home installations and users enrollment is moving slowly.

Mitigations

- Already deployed appliances/devices could be used for most of the use cases (e.g., Water Boilers for flexibility and sensors for Monitoring and Home Comfort).
- If some of the smart-meters will not be installed on-time, measurements by similar households will be used for training the forecasting models.
- Sanity checks and test runs could be done for all the HLUCs with the current number of participants. Normal execution of the HLUCs could be followed once we have reached the goal of participants.

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Pilot IT.01

Pilot ID	IT.01
Pilot Name	Italian Pilot
Pilot Responsible	s.fava@planetsmartcity.com

Work progress details

- Recruitment campaign → 40 contracts already signed
  - 2 workshops in presence
  - Communication and dissemination activities (social media, press, posters, leaflets, visual)
  - Promotion or participation to in situ activities (4 events already)
  - Landing page creation and continuous update (e.g.: FAQs)
  - Administrative activities (dedicated email and phone number active; registration of signed contracts
- Procurement activities
  - Definition of first batch to be produced and delivered within November 2021
- Deployment coding activities
  - End to end integration with Whirlpool cloud
  - Digital flexibility service logics definition
  - Early definition of grid constraints and requirements with RSE

Next steps

- Recruitment campaign→ 80 contracts to be signed
  - Second emotional video release
  - Communication and dissemination activities (social media, press, posters and leaflets)
  - Promotion or participation to in situ activities (Promotion of a theatre piece to engage community, participation to Sustainability Festival)
  - Landing page continuous update (e.g.: FAQs)
  - Administrative activities (dedicated email and phone number active; registration of signed contracts
- Procurement activities
  - Definition of purchase and installation plan (scheduling, logistics)
- Deployment coding activities
  - SAREFization of the service (activity already planned with WP3, WP7)
  - Data acquisition and definition of metrics for the DL EM algorithm

Risks

- Recruitment campaign:
  - Missing the identified target (no need to substitute a with good / I do not have enough space at home for a standard washing machine – dimension
- Procurement activity:
  - Missing tight deadlines and commitments with end users
  - Missing the installation of devices from a second producer (another location shall be found but with a certain timeline for procurement).
- Deployment coding activity
  - Lack of ontology specifics

Mitigations

- Recruitment campaign
  - Increasing presence and differentiating the engagement strategy (partially already in place)
  - Promotion of early results to challenge residents to participate
- Procurement activities
  - Definition of clear commitments and procedures (timelines, rules, responsibilities from production to installation)
- Deployment coding activity
  - Alignment with other Flex service providers (depending on communication SSA specificity: Triples- graph patterns or SPINE IoT

Pilot PT 01

Pilot ID	PT 01
Pilot Name	PT Pilot
Pilot Responsible	JOAO.FALCAO@E-REDES.PT

Work progress details	Next steps
• Improved version of the SPP submitted • Final actors established • Ongoing conversations with white appliances manufacturers to provide the devices to Portugal	• Customer recruitment to be adjudicated • Finish definition of data to be exchanged and development of services • Implementation of the solutions • Integration • Testing

Risks	Mitigations
• Lack of customers engaged for the demo • Customers do not respond with flexibility during demonstration • Partners role not matching project requirements and need of external procurement • Tools do not match expectation • DSO ICT ecosystem does not match project requirements	• Work and find alternative engagement strategies • Pre-agree flexibility activation without customer active participation • Define PT demo requirements and partners role • Closely participate in tools' definition and supervise its development • Prepare alternative data flow procedure

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Pilot NL.01

Pilot ID	NL.01
Pilot Name	Dutch pilot Eindhoven
Pilot Responsible	RGroenewold@volkerwessels.com

Work progress details

- Start with installation of dishwashers in NEXT building
- Setting up process with regular privacy/security session with DPO's and specialists of Building Owner, TNO and VolkerWessels
- Consumer interviews with potential tenants in relation to their wishes/demands for energy and non energy services
- Installation of sensors and gateways in Videolab building.
- First launch of dashboard for asset manager/building owner
- Launch ioffice app for test panel

Next steps

- Test/pilot installation of additional hardware in first apartment to optimize installation time and tackle possible issues
- Define and conclude privacy agreement of building owners
- Develop dashboards for commercial building
- Installation work to get Chargelounge (EV chargers + battery) connected and assess hardware status of batteries
- Choose energy supplier based on flexible tariffs and grid integration
- Installation connectivity in Next building (grid entering building and stores)
- Develop IPR strategy this year
- Develop customer service model for questions and complaints.

Risks

NEXT/Residential:
- Installation to be aligned with ongoing construction process

Videolab/Commercial:
- Integration with (old) charging stations and not (yet) functioning battery, cause of lacking battery management system.
- Implementing lessons learned can have an impact on the estimated delivery timeline

Mitigations

- Cooperation agreements signed between involved partners, to define and align (installation and testing) appointments
- Pre-testing of installation procedure
- Early start of project management and contact with developer/manufacturer of hardware to investigate missing software integrations. Inquiry for refurbishment of hardware and also complete exchange of hardware with multiple providers

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Overarching Pilot OV.01

Pilot ID	OV.01
Pilot Name	Overarching Pilot
Pilot Responsible	cami.dodgelamm@cyber-grid.com

Work progress details	Next steps
- Initial discussions held last year with most pilots - Petitioning for an earlier start date. Revised workplan submitted to Commission for review in August 2021. - Early adopter of the InterConnect Framework in WP5, partnering with 3E - Interconnect framework - architecture of Overarching demonstration has been defined - Definition of the ontology (SAREF) used within the overarching demonstration has been proposed (initial draft available)	- Approve the ontology by the stakeholders - State-of-play assessment of pilots (priority) - Launch of Technical coordination between cyberGRID and pilot members - Execute Technical Steps for Pilots Use Case Integration with the cyberNOC platform - Validation and Continuous Coordination

Risks	Mitigations
- Coordination and communication challenges with pilots - Technical difficulties connecting to other pilots due to any of the following: SAREFIZation, data exchanges and interoperability, aggregating flexibilities, and demonstrating functionalities. - Algorithms, methodologies developed for the InterConnect frameworks in previous work packages are not aligned with expectations.	- Pilots will be asked to assign a primary point-of-contact for cyberGRID. - Establish a high-level process for cyberGRID to follow when engaging with each pilot. - Formulate detailed plans and timelines with each pilot for the pilot/cyberGRID demo integration, accounting for outcomes and lessons learned from previous work packages (e.g. WP5).

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Conclusions

- This document is a first in a series of 10 for the follow-up of the pilot activities and for assessing their status within WP6 .

- 5 pilots indicate a lack of information regarding the whitegoods delivery and type in the project as the main bottleneck for installation. Pilot information sessions have been planned to mitigate this barrier.

- 3 pilots are waiting for previous infrastructure to be completed (such as smart metering) in order to continue with installation of devices.

- 3 pilots indicate the lack of maturity of the interoperability framework as an important risk for the installations.

- Lastly, three pilots have very strict time constraints for the installation of devices, which poses a risk as developments in the project have been delayed.

- The pilots contribute to interoperability by participating in the overarching cyberGRID flexibility use case. Next to this, they SAREFise existing and/or new services in order to make them interoperable. Several pilots will make use of services provided by other pilots (such as forecasters) in order to demonstrate interoperability. More details can be found in the individual dashboards for the pilots.

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