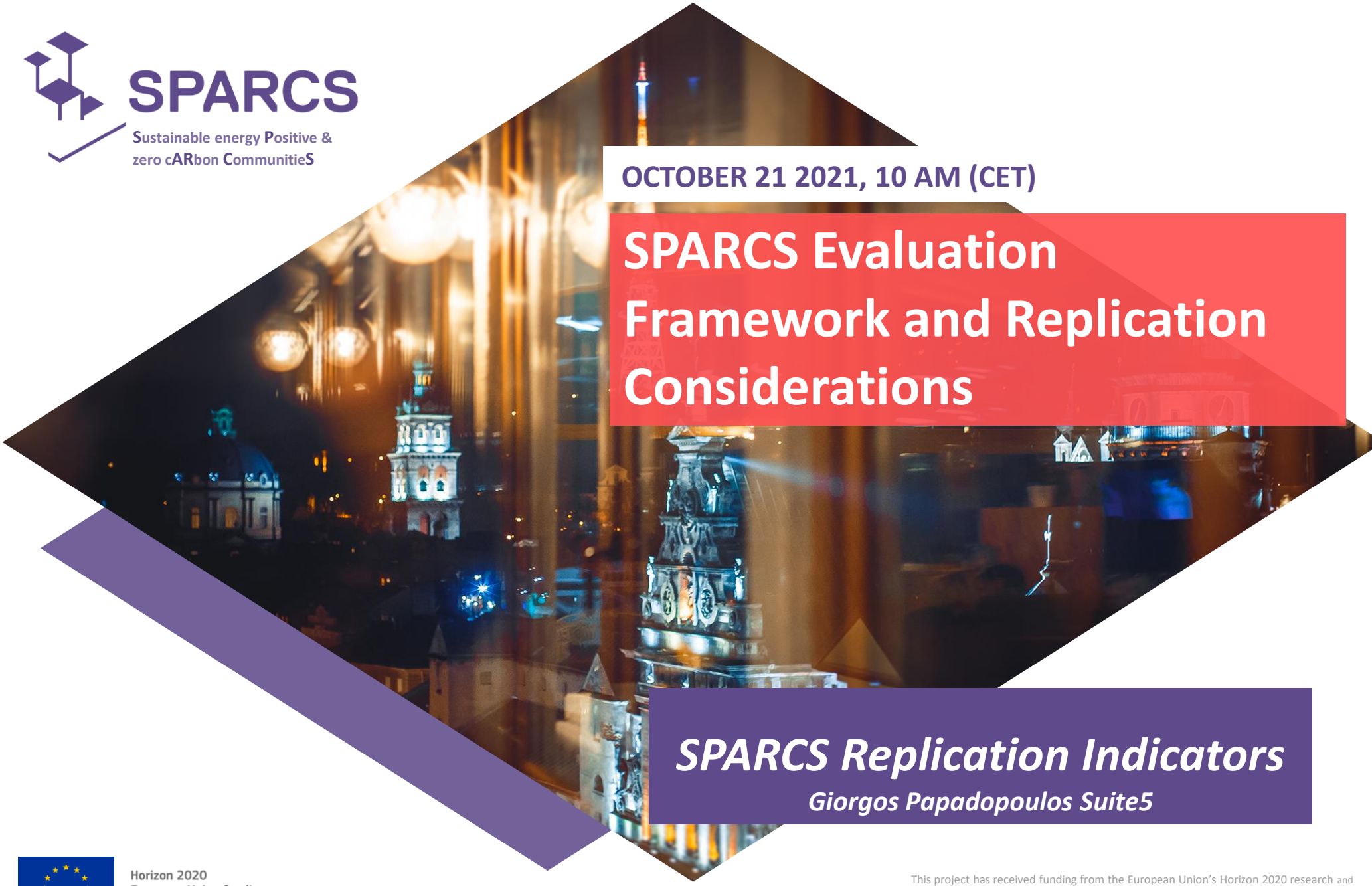
SPARCS

Sustainable energy Positive & zero cARbon CommunitieS



OCTOBER 21 2021, 10 AM (CET)

SPARCS Evaluation Framework and Replication Considerations

SPARCS Replication Indicators

Giorgos Papadopoulos Suite5

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Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communties

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Agenda

- 5-10 min welcome and intro to SPARCS (VTT)

- 20-25 min presentation on SPARCS evaluation framework (VERD)
- 5-10min Q&As

- **20-25 min presentation on replication Considerations (Suite5)**
- **5-10min Q&As**

Closing words

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Replication approach agenda

- SPARCS Holistic indicators approach
- Replicability indicators examples
- SPARCS replication indicators approach and example
- Pool of Indicators
- Considerations

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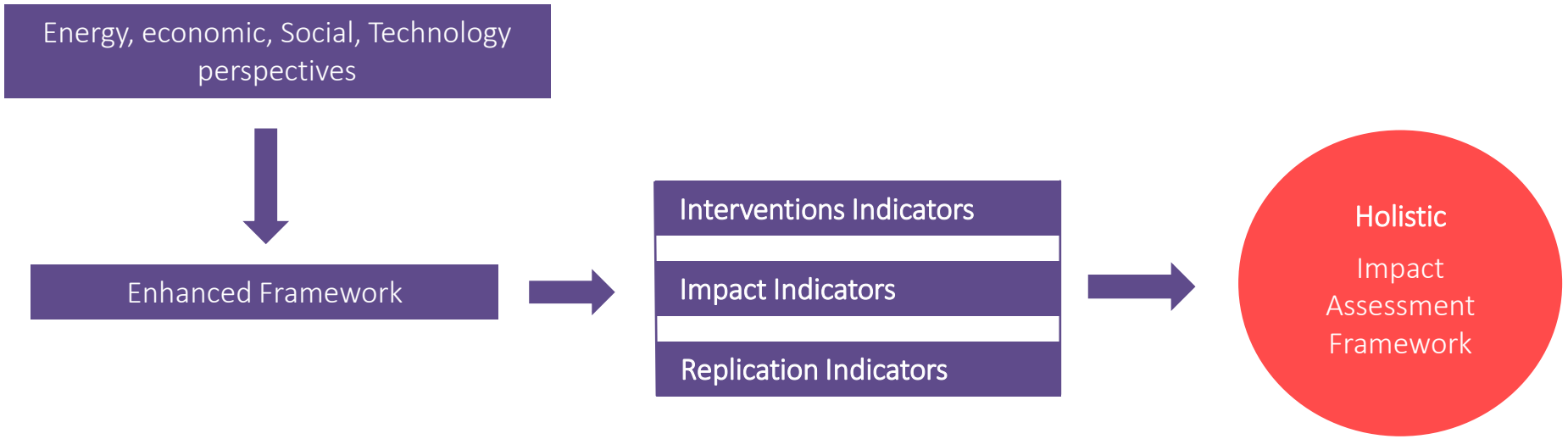
Holistic approach



Replication indicators, enabling accurate projection of the Impact Indicators considering wide capability and deployment of interventions at the Lighthouse, Fellow and other cities

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CITYkeys Replicability indicators examples

Indicator title	Indicator unit	Definition and extensive description
Social compatibility	Likert scale	The extent to which the project's solution fits with people's 'frame of mind' and does not negatively challenge people's values or the ways they are used to do things.
Technical compatibility	Likert scale	The extent to which the smart city solution fits with the current existing technological standards/infrastructures
Market demand	Likert scale	The extent to which there is a general market demand for the solution
Advantages for end users	Likert scale	The extent to which the project offers clear advantages for end users
Advantages for stakeholders	Likert scale	The extent to which the project offers clear advantages for Stakeholders

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SPARCS Replication approach

Intervention assessment
City/District characterization
Intervention requirements

→

Impact assessment

→

Replication assessment
Candidate City/District characterization
Candidate Intervention requirements

Interventions Indicators

Enhanced with additional indicators
To be able to **"screen a city/district" and define intervention**

→

Impact Indicators

To be able to **assess the impact** of interventions
Baselining will allow setting the point of reference
Normalization will allow comparisons.
Build a list of successful interventions

→

Replication Indicators

To be able to screen the candidate city/district, identify interventions that match and propose the ones with positive impact assessment for replication.

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Replication approach example

Example: Espoo Lippulaiva

Screen District and intervention requirements:
Storage equipment available
Annual RES generation
Annual non-RES generation
Temperature
Heating/Cooling Degree Days
Orography
……

Implement interventions:
Enhance PED self –sufficiency, PVs, Storage, EMS
Increase EV bicycles utilization

Assess Impacts:
District RES Generation increase
Total non-RES generation reduction
Total energy demand reduction
Increase of citizens using EV bicycles

Successful intervention:
Enhance PED self –sufficiency, PVs, Storage, EMS
Increase EV bicycles utilization

Example: Kladno district

Screen candidate District:
Storage equipment available
Annual RES generation
Temperature
Heating/Cooling Degree Days
Orography
…

Replicate intervention:
Enhance PED self –sufficiency, PVs, Storage, EMS

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Indicative Pool of Indicators

KPI name	Area	Category
Annual RES generation (PV, Wind, Hydro, Biomass, other)	District	Energy
Annual non-RES generation (Diesel generators, Steam Turbines, Gas Turbine, other)	District	Energy
Annual Import/Export of energy	District	Energy
Number of installations per source (RES and non-RES)	District	Energy
Annual Open District heating utilization	District	Energy
RES penetration	District	Energy
Max RES Penetration Potential (capacity)	District	Energy
Storage (type, #, Capacity)	District	Energy
Annual total demand (Electricity, Heating)	District	Energy
Peak Demand	District	Energy
Energy Cost (Electricity, Heating)	District	Energy
Size of the District	District	Physical Geography
Orography of the District	District	Physical Geography
Temp (Max/Min/Average)	District	Physical Geography
Average Sunshine hour per year	District	Physical Geography
Average Rainy days per year	District	Physical Geography
Heating Degree Days	District	Physical Geography
Cooling Degree Days	District	Physical Geography

KPI name	Area	Category
Population (#, age distribution, gender rates, life expectancy)	City/District	Social
Employment (Rate, unemployment male/female/youth)	City/District	Social
Air polution (CO2, GHG, small particulates and tHC volatile hydrocarbons)	City/District	Environmental
Climate Resilience Strategy	City	Environmental
District Noise Pollution	District	Environmental
GDP per capita	City	Economy
Energy poverty status	City	Economy
Transport infrastructure (Km of roads for cars, bicycles,)	District	Transport
Transport infrastructure (Public transportation lines, # of stops)	District	Transport
Stock of vehicles (Cars, Motrocycles, Bikes, Buses,)	City/District	Transport
Modal Split	City/District	Transport
Transportation deaths	City	Transport
Internet access (fixed, mobile)	City/District	Telecommunication
Legal framework compatibility	City	Governance
Budget spent on city management (Euros)	City	Governance
Number of active market participants in prosumer models	City	Citizen engagement
Number of actively involved partners in energy solutions	City	Citizen engagement

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Considerations

- Identified pool of indicators should be utilized based on the needs of individual interventions – Part of supplementing actions
  - Intervention analysis to define main and secondary technical requirements – indicators
  - Need to capture different dimensions, dissimilar contexts, different cultures and environments
- Capturing the pilot City/District characteristics of EU projects, combined with a technical requirements list for solutions/interventions, would allow a broader utilization of the SPARCS approach.
- Complete SPARCS replication strategy will combine
  - a knowledge exchange platform
  - Replication strategy and execution in LHCs and FCs
  - Procurement of highly integrated and energy efficient solutions.

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Thank you!

Questions?

Giorgos Papadopoulos
giorgos@suite5.eu

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Giorgos Papadopoulos, Suite5

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