WORKSHOP SMART BUILDINGS 2020 10 28

DEVELOPMENT OF THE EU SMART READINESS INDICATOR (SRI) FOR BUILDINGS

Stijn Verbeke
(VITO/EnergyVille)

CONTEXT

Smart and digital technologies in the building sector enable:

- Cost–effective energy efficiency savings
- Better integration of renewables to the energy grid
- Tangible benefits for users in terms of comfort, health and well-being

EXAMPLE APPLICATIONS:

- optimised energy use as a function of (local) production
- optimised local (green) energy storage
- automatic diagnosis and maintenance prediction
- improved comfort for residents via automation

SMART READINESS INDICATOR IN THE EPBD

The **Energy Performance of Buildings Directive** (EPBD) (EU 2018/844; 19 June 2018) requires the development of **an optional Common Union scheme for rating the smart readiness of buildings: the "Smart Readiness Indicator" (SRI)**

The Smart Readiness Indicator intends to

- ***raise awareness*** *about the benefits of smart technologies and ICT in buildings*
- ***motivate consumers*** *to accelerate investments in smart building technologies; and*
- ***support the uptake of technology innovation*** *in the building sector*

3 "SMART READINESS" ASPECTS IN THE SCOPE OF THE SRI STUDY & EPBD

The ability to adapt its operation mode in response to the needs of **the occupant** paying due attention to the availability of user-friendliness, maintaining healthy indoor climate conditions and ability to report on energy use

The ability to maintain energy efficiency performance and **operation** of the building through the adaptation of energy consumption for example through use of energy from renewable sources

The flexibility of a building's overall electricity demand, including its ability to enable participation in active and passive as well as implicit and explicit demand-response, in **relation to the grid**, for example through flexibility and load shifting capacities

TECHNICAL SUPPORT STUDIES FOR EC DG ENER

Aim

Provide technical inputs to feed the establishment of the SRI for buildings by the European Commission:

- Consolidation of definition and calculation methodology
- Investigate implementation pathways
- Perform quantitative analysis of potential impacts of the SRI in the EU

Consortium 2nd study

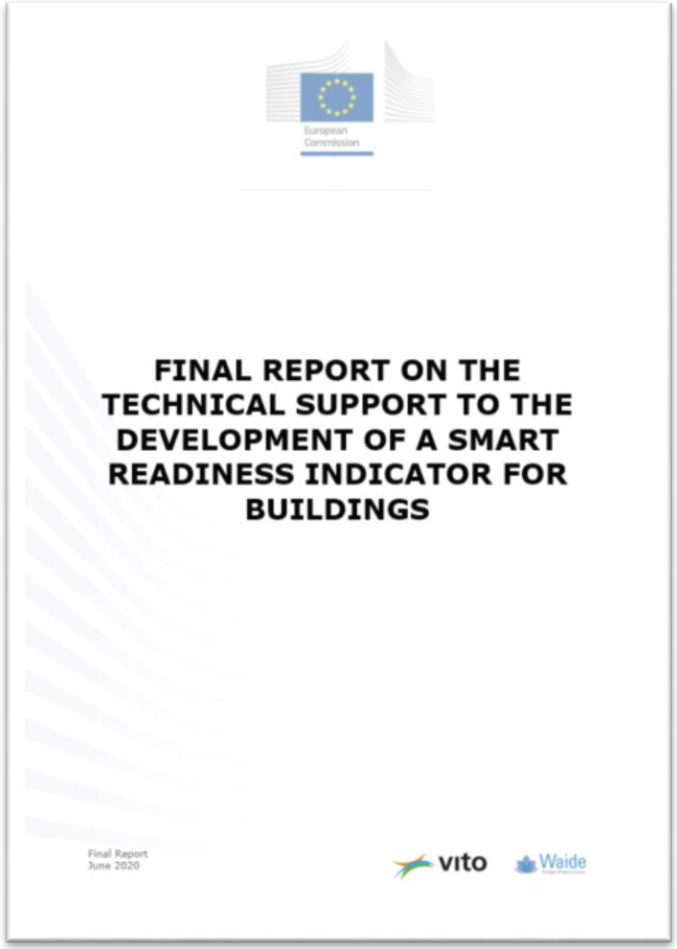
vito, Energy Ville, Waide Strategic Efficiency Europe

Website

https://smartreadinessindicator.eu/

Timeline

- First study: Mar 2017 – Aug 2018
- Second study: Dec 2018 – June 2020



PROPOSED SRI METHODOLOGY

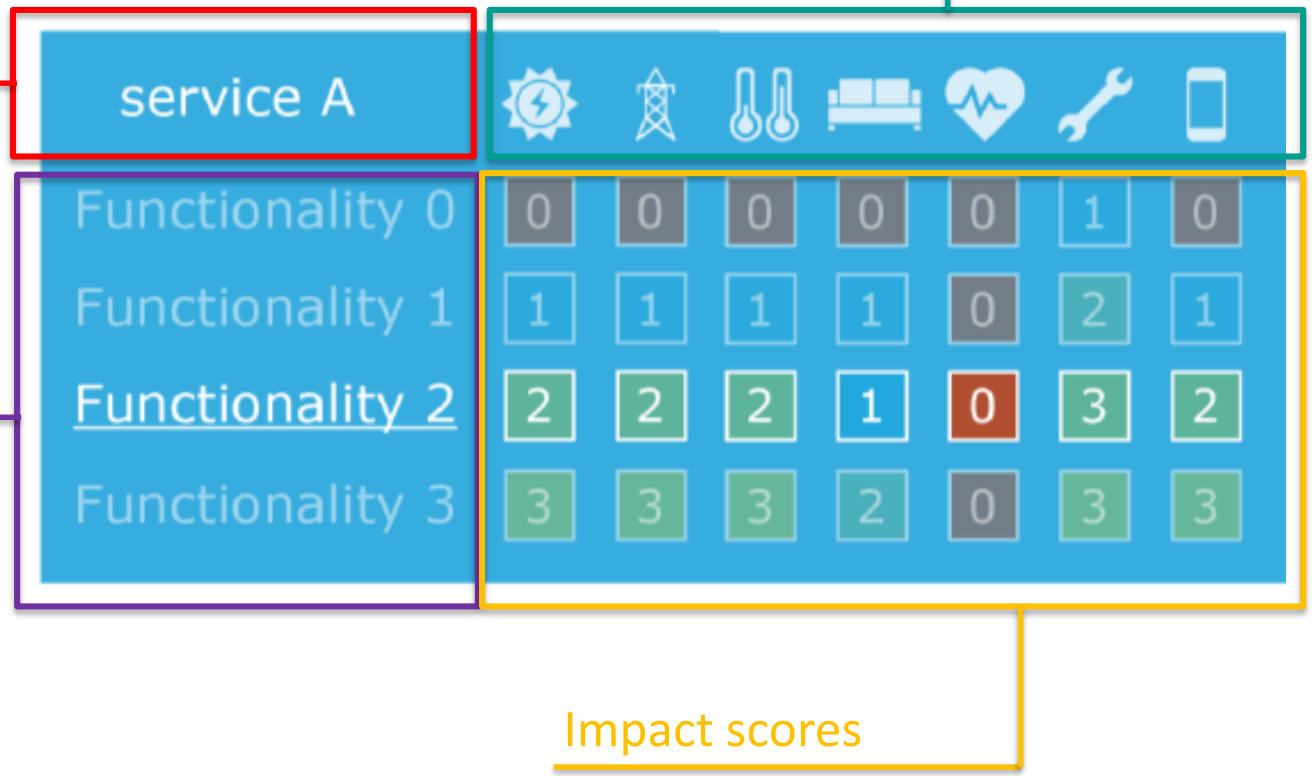
METHODOLOGICAL FRAMEWORK

= multi-criteria assessment, scoring the impacts of smart services according to 7 impact categories

Catalogue of 54 technology-neutral smart ready services

7 impact categories

A service can be implemented with various functionality levels, i.e. degrees of 'smartness'

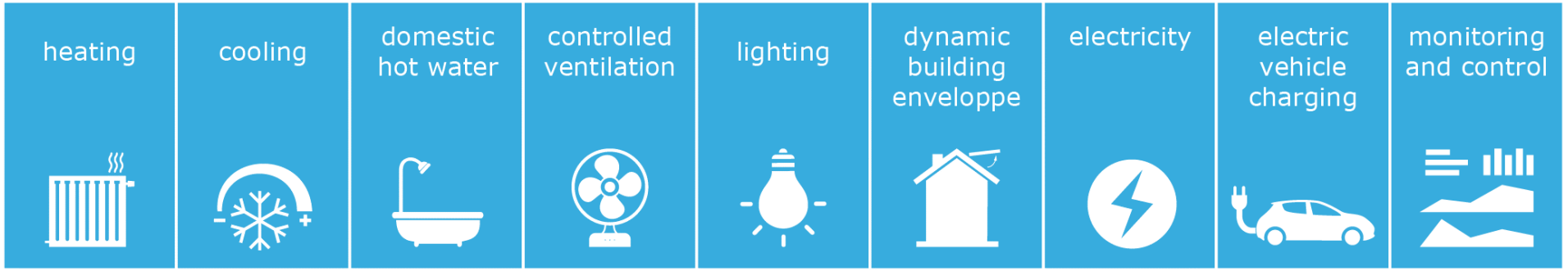


Impact scores

SMART READY SERVICES

- Services are enabled by (a combination of) smart ready technologies, but are defined in a technology-neutral way, e.g. '*provision of temperature control in a room*'
- 2 catalogues of services: simplified (method A) and detailed (method B)
- services are structured within nine **domains**

DOMAINS



FUNCTIONALITY LEVELS

- For each of the services, 2 to 5 **functionality levels** are defined. A higher functionality level reflects a “smarter” implementation of the service, which generally provides more beneficial impacts to building users or to the grid

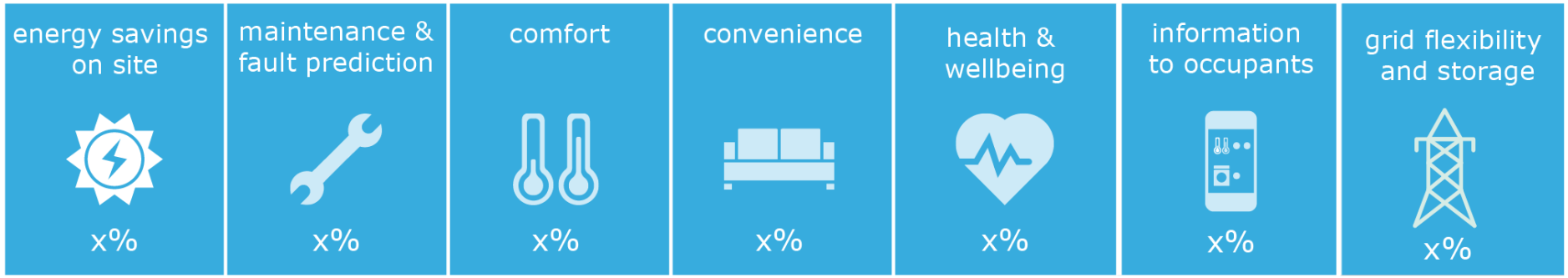
EXAMPLE SERVICE:

Service	Functionality level 0 (as non-smart default)	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4
Heat emission control	No automatic control	Central automatic control (e.g. central thermostat)	Individual room control (e.g. thermostatic valves, or electronic controller)	Individual room control with communication between controllers and to BACS	Individual room control with communication and presence control

IMPACTS

- For each of the functionality levels of each of the services, the impacts are defined according to 7 impact categories

IMPACT CATEGORIES

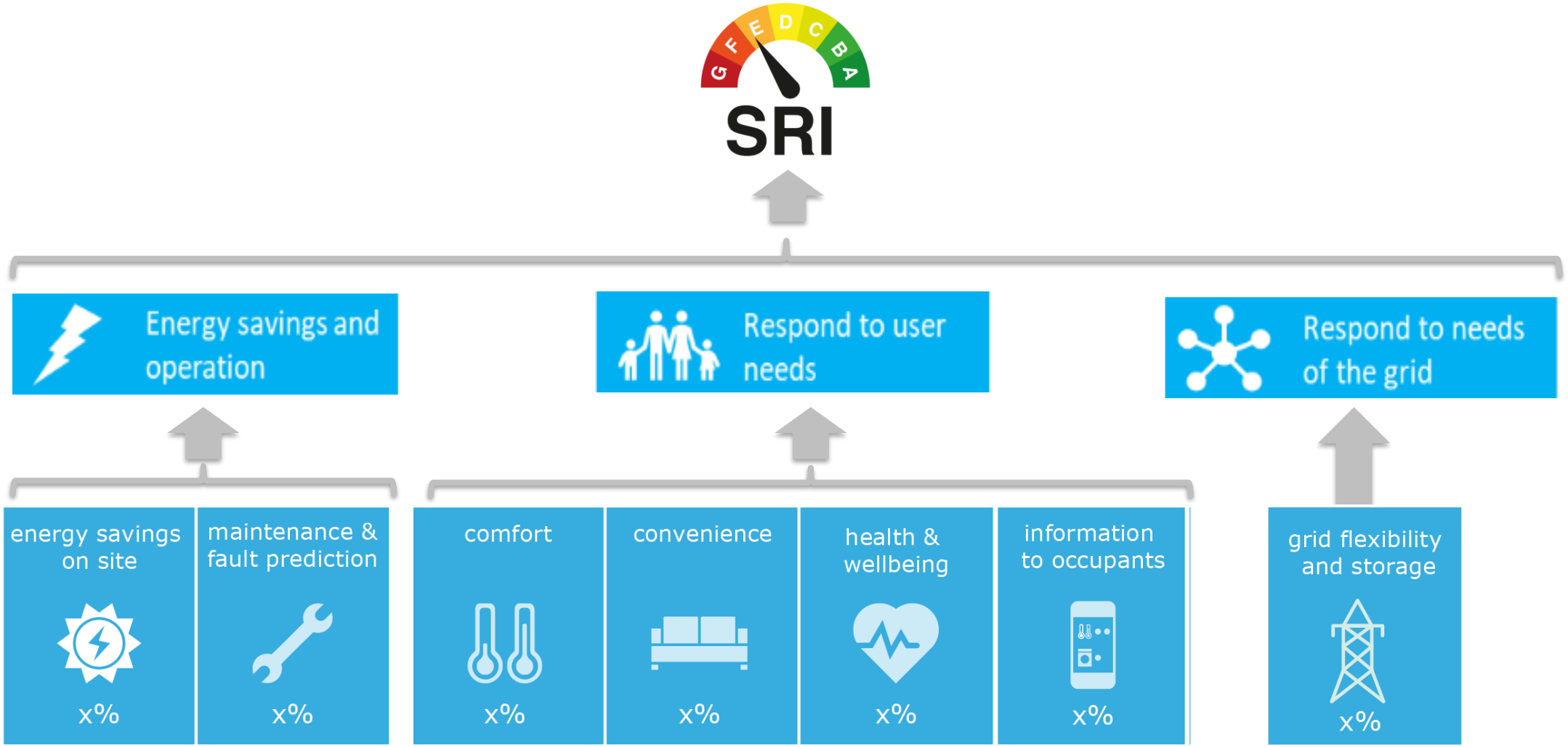


AGGREGATING IMPACT SCORES

SINGLE SCORE INDICATOR

3 KEY THEMES

IMPACT CATEGORIES



SRI ASSESSMENT PROCESS

Example application SRI method A/B

- STEP 1: Which services are relevant for this building?

  e.g. if there is no DHW, there is no need to inspect how this is controlled

- STEP 2: Assess the functionality level of each relevant service

example

Service	Functionality level 0 (as non-smart default)	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4
Occupancy control for indoor lighting	Manual on/off switch	Manual on/off switch + additional sweeping extinction signal	Automatic detection (auto on / dimmed or auto off)	Automatic detection (manual on / dimmed or auto off)	

- STEP 3: Calculation: count impact scores and apply weightings
- STEP 4: Calculation: What is the maximum obtainable score?
- STEP 5: Calculate normalised SRI score

Example application:
EnergyVille I office, Genk, Belgium

Result

	Energy	Flexibility	Self-generation	Comfort	Convenience	Wellbeing and Health	Maintenance & fault prediction	Information to occupants
Ordinal impact score case study building	**54**	**18**	**5**	**34**	**42**	**13**	**16**	**20**
Maximum obtainable score for the case study building	**73**	**25**	**5**	**45**	**61**	**19**	**23**	**30**
Relative score	**74%**	**72%**	**100%**	**76%**	**69%**	**68%**	**70%**	**67%**

Overall score after weighting: 77% of the potential smartness impacts can be achieved

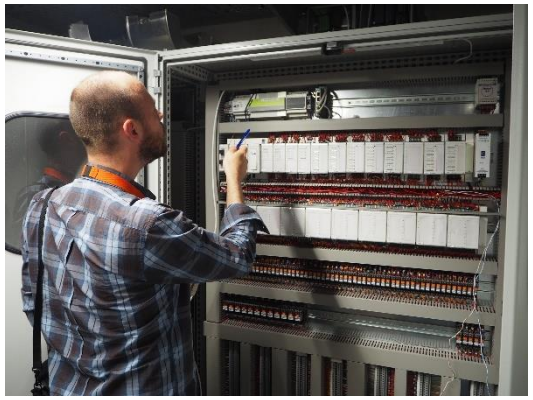
SRI ASSESSMENT PROCESS

- Checklist & walkthrough to assess the smart services present in the building

- Public beta test:
  - 112 assessments
  - carried out voluntary by stakeholders
  - in 21 EU Members states

→ Feasibility of the approach proven
→ Efforts: <1 hour for simplified method
<4 hours for detailed method



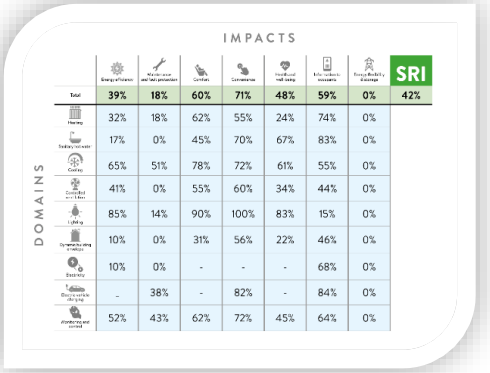


FORMATTING AND COMMUNICATING THE SRI

- Study team explored graphical design options

- Consumer focus groups
  → Confirm interest with general public
  → Preference for detailed insights
  (*not solely a single score*)

- SRI can also document cross-cutting issues
  e.g. information on interoperability aspects



EVALUATING EU IMPACTS OF THE SRI

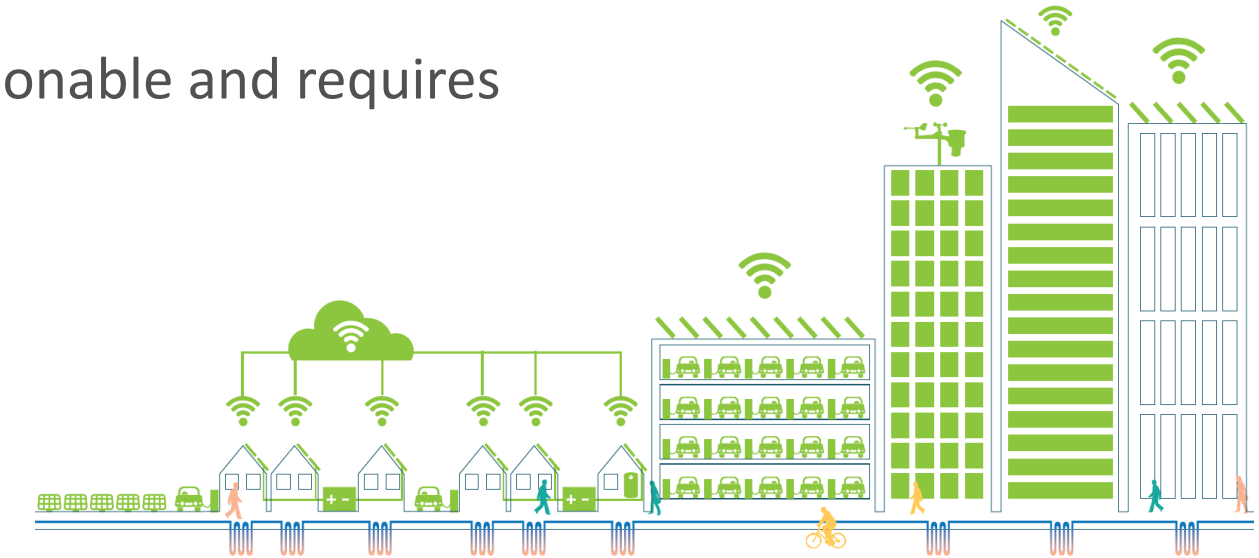
- Market pull effect
  = raising awareness through the assessments
- Market push effect
  = common framework for services providers

- potential impacts for the EU – order of magnitude:
  SRI could unlock up to 5% extra final energy savings by 2050 in EU (*on top of "agreed EPBD amendments" scenario*), 181 billion euro investments and 32 million tonnes of avoided CO_2 emissions

CONCLUSIONS

CONCLUSIONS BY THE TECHNICAL STUDY TEAM

- The Smart Readiness Indicator is a cost-effective instrument which can unlock the untapped potential of smart technologies in the building sector
- The deployment of a common terminology and rating scheme for smart building technologies is strongly supported by consumers and industrial stakeholders
- The proposed methodology is simple, actionable and requires acceptable efforts



THANK YOU FOR YOUR ATTENTION

stijn.verbeke@vito.be

Additional information

- https://smartreadinessindicator.eu/
- https://ec.europa.eu/energy/
- www.vito.be
- www.energyville.be
- Smartbuilt4EU project

  (website under development)