COMPARISON OF SMART READINESS INDICATOR (SRI) METHODOLOGIES

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CONTEXT

THE ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE

The **EPBD regulates energy related aspects** at EU level with the goal to increase energy efficiency in buildings.

This regulation needs to be translated into **national law**.

The latest revision (2018) of the EPBD foresees (amongst other improvements), the implementation of a **Smart Readiness Indicator (SRI).**

The aim of the SRI is to provide an indicator, that assesses **how *smart* a building** is and how it contributes to an intelligent energy system.

The actual **methodology is not yet fully determined** and is currently being analysed within a five-year test phase by the member states.

CONTEXT

THE EUROPEAN AND NATIONAL BUILDING REGULATIONS

CONTEXT

THE SMART READINESS INDICATOR

"…The smart readiness indicator should be used to measure the capacity of buildings to use information and communication technologies and electronic systems to ***adapt the operation of buildings to the needs of the occupants and the grid*** *and to* ***improve the energy efficiency and overall performance of buildings****. The smart readiness indicator should raise awareness amongst building owners and occupants of the value behind building automation and electronic monitoring of technical building systems and should give confidence to occupants about the actual savings of those new enhanced-functionalities…"*

Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 Amending Directive 2010/31/EU on the Energy Performance of Buildings Directive 2012/27/EU on Energy Efficiency; L156/75; Official Journal of the European Union: Brussels, Belgium, 2018.

METHODOLOGY

COMPARISON OF THREE METHODOLOGIES

SRI EC

SRI Austria

SRI BOKU

Difference in **purely qualitative (SRI EC)** or a **mix** of qualitative and quantitative approach (SRI Austria) or a **purely quantitative** (SRI BOKU) approach.

Comparison of key parameters in the three methodologies

Parameter	SRI EC	SRI Austria	SRI BOKU
Storage	x	x	x
Load	x	x	-
Total energy demand	-	-	-
Grid interaction	-	x	x
Heating	x	x	x
Cooling	x	x	x
Ventilation	x	x	x
Hot water	x	x	x
On-site energy generation	x	x	x
Dynamic building skin	x	x	x
Monitoring and Building Management System (BMS)	x	x	x
User Integration	-	x	-

METHODOLOGY

CASE STUDIES

Key data of **prototypical case studies** used for comparative assessment

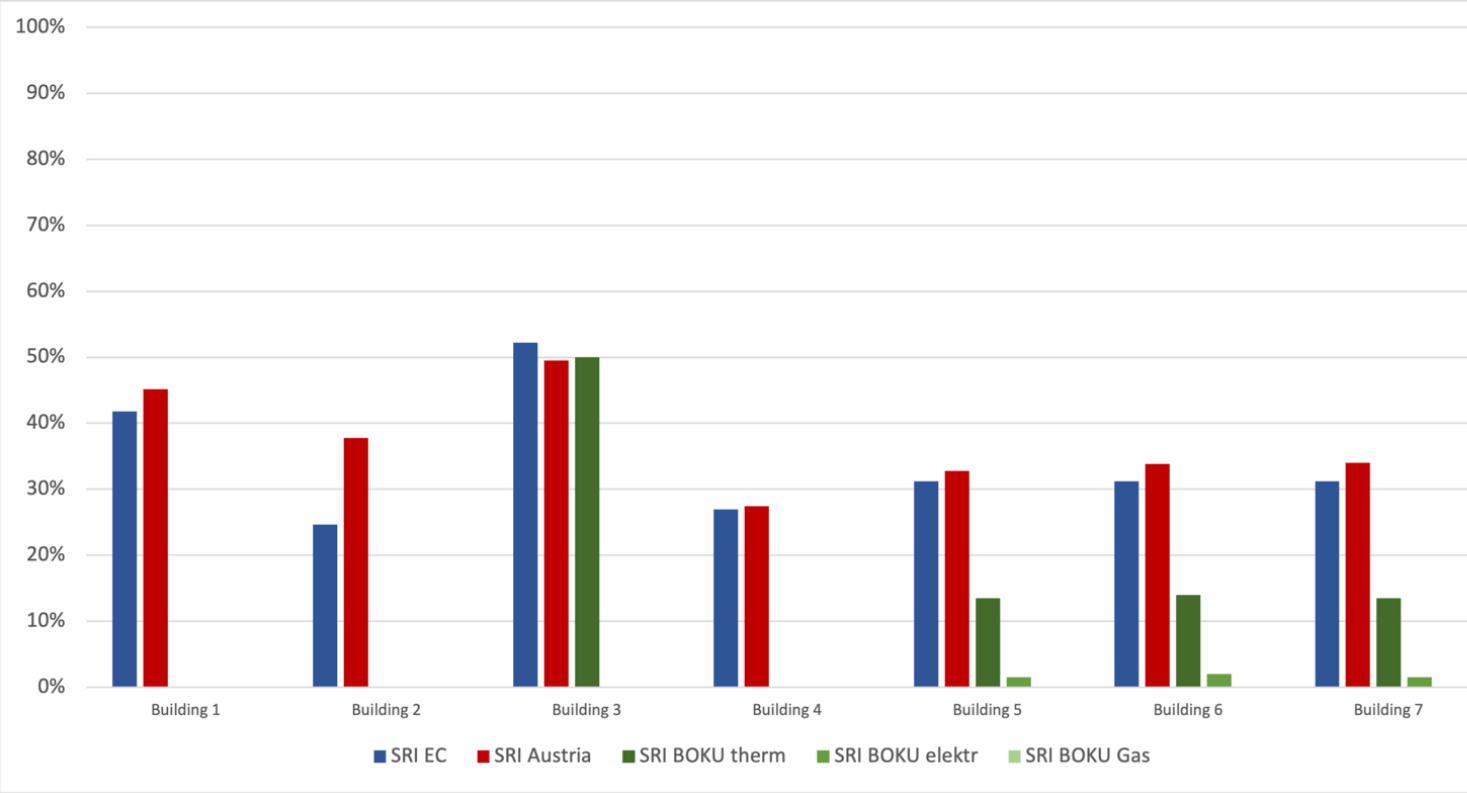
	Building 1	Building 2	Building 3	Building 4	Building 5	Building 6	Building 7
Building type	office	residential	office	university / office	multi-family residential	multi-family residential	multi-family residential
Year of construction	2012	2004	2008	2020	2017	refurbished 2017	refurbished 2017
Gross floor area [m²]	8820	417	9430	4080	743-1080	227	665
Building system	GWHP, DH	biomass boiler	GWHP	district heating, chiller	microgrid, local heating network, BM	microgrid, local heating network, BM	microgrid, local heating network, BM
Heating	TAS, underfloor heating	TAS	TAS	TAS	LTSH	radiators	radiators
Hot water	electrical water heater	solar thermal, biomass	electrical water heater	electrical water heater	LHN, E- storage in summer	LHN, E-storage in summer	LHN, E-storage in summer
On-site energy generation	PV on roof and facade, 2 small scale wind turbines	PV on roof and facade, solar thermal	PV on roof and facade, solar thermal	-	PV on roof	PV on roof	PV on roof
Storage	-	thermal storage	thermal storage	3000l heating storage	electrical in local grid	electrical in local grid	electrical in local grid
BMS	yes	-	Yes	yes	yes	yes	yes

RESULTS

COMPARISON OF RESULTS

SRI results for the applied methodologies from the prototypical case studies

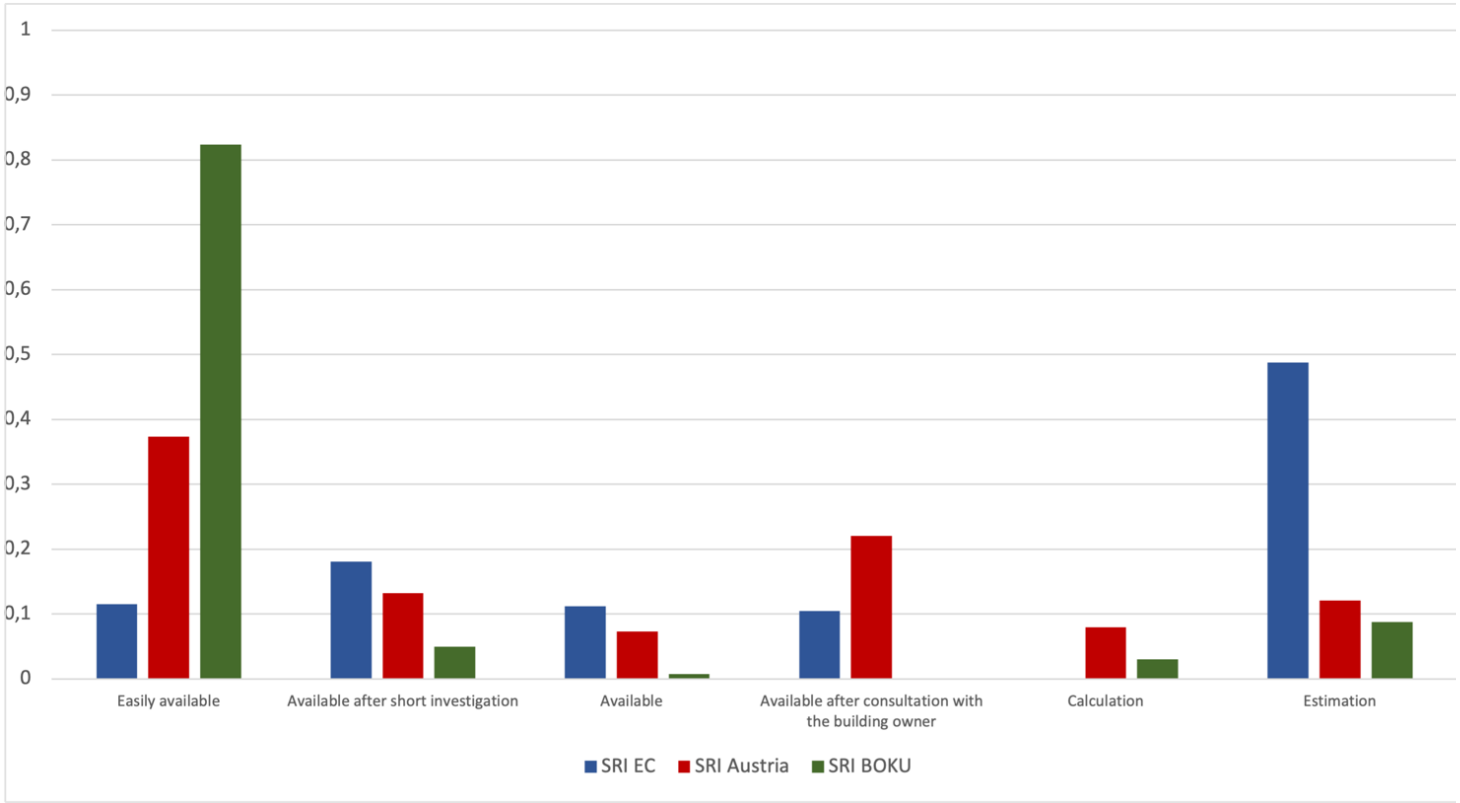
Results have been normalized towards a 100% range for comparability



RESULTS

COMPARISON OF DATA EFFORT

Comparison of ease of data acquisition between the three methodologies



CONCLUSION

THE APPROACHES VARY...

A **qualitative (subjective) approach** leads to a **series of assumptions** and thus different results by different users. A purely qualitative approach is thus **highly assessor-dependant**.

A purely objective and data-driven approach can be limited in terms of a very comprehensive result. The results will highly depend on the **quality and availability of the data** at the time of the assessment (e.g. at the design stage).

The **time and data-availability factor** needs to be taken into account.

More case-studies need to be analysed to draw more comprehensive conclusions.

There is no best methodology, as it depends on what the key driver should be...

TO BE DISCUSSED...

...WHEN IS A BUILDING *SMART* ?