

**Austria****FACTSHEET**

Policy recommendations for sustainable plus energy neighbourhoods and buildings

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Glossary of Terms



CEC	Citizen energy community
CSC	Collective self-consumption
DH	District heating
DSF	Demand-side flexibility
EED	Energy Efficiency Directive
EMD	Electricity Market Design
EPBD	Energy Performance of Buildings Directive
REC	Renewable energy community
NZEB	Nearly zero-energy building
P2P	Peer-to-peer
PPA	Power purchase agreement
REDII	Renewable Energy Directive
SPEN	Sustainable plus energy neighbourhood
SRI	Smart readiness indicator

Authors

Victoria Taranu (BPIE), Vivian Dorizas (BPIE)

Contributors

Jelena Simjanovic (BPIE), Pedro Crespo del Granado (NTNU),
Strassl Ingeborg (SIR), Radermacher Margit (SIR),
Laura Hurtado Verazain (ABUD), Ábel Magyari (ABUD),
Andrea Kerstens (TNO)

Reviewers

Zsolt Toth (BPIE), Oliver Rapf (BPIE), Clara Mafé Cortés (Housing Europe),
Julien Dijol (Housing Europe), Margaux Barrett (BPIE), Niki Gaitani (NTNU)

Graphic design Luca Signorini (Distudio)



Sustainable plus energy neighbourhoods

Sustainable plus energy neighbourhoods (SPENs) can contribute to decarbonising the building stock, while providing additional benefits for residents both at the building and neighbourhood level, enhancing wellbeing and a sense of community. SPENs can provide a range of shared spaces, services and facilities, such as shared heat pumps, PV panels, EV charging, EVs, bicycles, and common spaces with greenery, water and biodiversity. A neighbourhood approach provides additional benefits to demand-side flexibility (DSF) compared to single apartments or buildings. The optimisation of electricity and heat production and sharing renewable energy from various sources is managed by a system of twin modelling and automation.

Shared assets, services and collective energy production installations interact differently with the urban infrastructure thus they often require new legislative frameworks. The Clean Energy Package of 2019 has important provisions to fill in these gaps and allow collective forms of producing, sharing and selling of energy, as well as to encourage prosumers to enter the market. This factsheet maps Austria's progress in implementing provisions of the 2018 Energy Performance of Buildings Directive (EPBD)¹, the Energy Efficiency Directive (EED)², the Renewable Energy Directive (REDII)³, and Electricity Market Design (EMD)⁴. It reviews the latest developments in national, regional and municipal policies regarding the following aspects relevant to SPENs: i) energy performance, ii) renewable energy and energy communities, and iii) digital technologies and demand-side flexibility⁵. The factsheet provides an overview of existing gaps and barriers in the development and market uptake of SPENs, and provides policy recommendations.

The factsheet also lists the drivers, potential business models and policy support measures that enable investments and wider uptake of SPENs. The policy mapping and recommendations are based on desk research, ten interviews and two workshops with experts from the private and public sectors, including developers and local authorities involved in projects of SPEN and energy communities.

¹ Directive (EU) 2018/844

² Directive (EU) 2018/2002

³ Directive (EU) 2018/2001

⁴ Directive (EU) 2019/944

⁵ A complete policy mapping is available in Boll et al. (2021)



1. Energy performance

The positive energy balance of a SPEN can be achieved with three subsequent steps:

- Sufficiency measures at neighbourhood level
- Reducing energy demand with energy efficiency measures at the building level
- Collective production and sharing of renewable energy

Energy sufficiency aims to reduce total energy consumption by analysing the need of services, spaces and the technology use in the design phase, by providing an adequate level of utility or services from energy. Sufficiency measures within SPENs, such as shared heating systems, EV charging stations, EVs, bicycles and common spaces, can reduce both operational and embodied emissions. The second type of measures that aim at reducing energy demand at the building level depend on building regulations for new constructions and renovations. Finally, after reducing the energy demand, the low amount of energy required should be covered by renewable energy produced and shared within SPENs.

The 2010 EPBD⁶ mandated nearly-zero energy (NZEB) for new constructions by 2020 and minimum energy requirements for major renovations. This section will describe in detail the implementation of minimum energy performance requirements in Austria, considering that more ambitious requirements at the building level will also have an impact on the energy balance of SPENs. All the **syn.ikia demo projects** have implemented ambitious targets at the building level going beyond the statutory minimum requirements. Given the scope and ambition of SPENs to achieve energy-positive performance levels, a broader set of policy provisions and support measures are being reviewed, including policies that aim to reduce lifecycle climate impacts.

⁶ Directive 2010/31/EU

Minimum energy performance requirements

The implementation of the EPBD (Directive (EU) 2018/844) in Austria is the responsibility of the nine provinces (Länder). The Institute of Construction Engineering (OIB) of Austria was assigned to align the regional implementation of the EPBD in 2006. The outcome of this work is the **OIB Guideline 6**, which is being implemented in the building regulations of each province. Relevant to SPENs, each province has its own subsystem of authorities, agencies and institutions. The main strength of this multi-level governance approach is that it is well adapted to local specificities and market needs (Boll et al., 2021).

The Austrian National Energy Efficiency Action Plan (NEEAP) was first published in 2014 and revised in 2018. To achieve the 2020 energy efficiency requirements, the national building renovation directive (OIB Guideline 6) was tightened every second year. Austria has started defining the national goals for 2030 and beyond based on the Paris Agreement. According to the OIB Guideline 6, the requirements for residential buildings differ from those for non-residential only in including requirements for the maximum cooling energy demand. The remaining requirements – concerning U-values, space-heating demand, heating and final energy demand, and the final energy factor – are the same.

Table 1: Minimum energy performance requirements for NZEB for new buildings.
Source: (CA EPBD, 2020)

	(useful) Space heating demand $H_{W_{BRef, RC, max}}$ (kWh/m²per year)	Final energy demand EEB_{max} (kWh/m²per year)	Total energy efficiency factor f_{GEE} (-)	Primary energy demand PEB_{max} (kWh/m²per year)
Residential NZEBs	$10 \times (1+3.0/l_c)$ Using $HTEB_{Ref}$			41
Non-residential NZEBs	or			
	$10 \times (1+3.0/l_c)$ Using $HTEB_{Ref}$			84

Ref: Reference space heating demand for reference climate

RC: Reference climate

l_c : Characteristic length of the building or building shape factor (V/A) (m)

HTEB: Heating system – auxiliary energy demand for the heating system

PEB: Primary Energy Demand

The Austrian national plan defines a NZEB as an energy-efficient building with a thermally well-insulated envelope and an efficient heating system (CA EPBD, 2020).

The two following methods can be used to comply with the requirements of the OIB Guideline 6:

- Provision of the maximum permissible space heating demand and final energy demand of the building. The focus, in this case, lies on ensuring a tight building envelope to reduce the space heating demand (HWB) (without taking into account the total energy efficiency factor⁷, which reflects the type of energy use and production).
- Installation of a very efficient or renewable heating system. The total energy efficiency factor (f_{GEE}), which reflects the type of energy use and production, must be taken into account. In this method, a slightly higher space heating demand of the building is acceptable.

The maximal values for the non-renewable primary energy demand are defined in both cases. For achieving renewables requirements, Austria offers a set of options – such as 80% of heating and hot water needs met by renewable sources, or 20% of electricity sourced from solar PV (BPIE, 2021).

The minimum energy performance requirements for NZEB for new residential and non-residential buildings are shown in Table 1, and for existing buildings are summarised in Table 2.

Table 2: Maximum value requirements for the energy performance of major renovations of existing buildings. Source: (CA EPBD, 2020)

	Requirements by heating energy demand		Requirements by total energy efficiency factor	
	Space heating demand $HWB_{Ref,RC, max}$ (kWh/m ² per year)	Final energy demand $EEB_{RC,max}$ (kWh/m ² per year)	Space heating demand $HWB_{Ref,RC, max}$ (kWh/m ² per year)	Total energy efficiency factor $f_{GEE,RC,max}$ (kWh/m ² per year)
Residential buildings/ Non-residential buildings	$17 \times (1 + 2.9/I_c)$	Final energy demand** $EEB_{RB,RK,max}$	$25 \times (1 + 2.5/I_c)$	0.95

* **Ref:** Reference space heating demand for reference climate

** Based on specific reference buildings and values described in OIB Guideline 6

RC: Reference climate

I_c : Building shape factor

⁷ f_{GEE} factor: Total energy efficiency factor (Gesamtenergieeffizienzfaktor)

Policies to encourage positive energy buildings

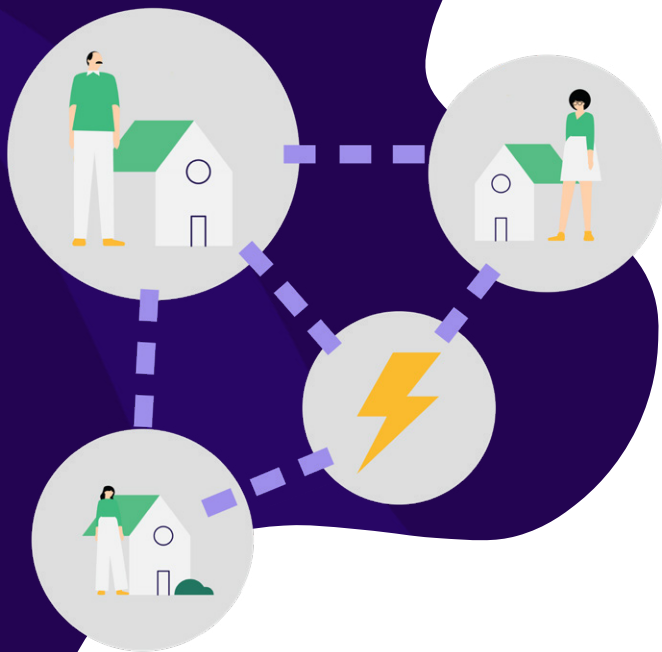


Austria has a wide range of SPEN-related policies covering energy efficiency; but there is no specific legislative framework yet available for an integrated SPEN approach.

Austria is still delayed with the transposition of the EU's EED (Directive (EU) 2018/2002); however, the Federal Energy Efficiency Act is a necessary step to make SPENs possible. On the other hand, the Austrian Development and Resilience Plan contains a set of measures designed to tackle the Covid-related economic crisis and accelerate growth, job creation, and economic and social resilience through supporting the green and digital transition.

Table 3: Main policy updates (for a complete list of policies relevant for SPENs and energy efficiency, see Boll et al. (2021))

Policy/initiative	Implementation level	Main provisions
<u>Federal Energy Efficiency Act 2014</u>	National	Targets lower consumption by energy providers, large companies and government agencies aiming to increase Austria's energy efficiency by 1.5% per annum, starting in 2014. The Austrian federal administration is obliged to rent or purchase only buildings or parts of buildings with high energy efficiency.
<u>Austrian Recovery & Resilience Plan 2020 – 2026 / 4. Just recovery pillar</u>	National	Supports resilient municipalities and targets thermal building renovation in town centres, façade greening, connections to highly efficient district heating systems, and brownfield recycling. Aims to increase energy efficiency in buildings and reduce greenhouse gas emissions.
<u>Social housing subsidies – law of the federal county of Salzburg</u>	Municipal	Subsidies for higher energy performance of new social housing and for renovation.
<u>Klimaaktiv certification system</u>	National	The certification offers different status levels according to sustainability standards, such as the use of sustainable materials, mobility, comfort, etc. It also has a declaration at district level with six categories: project management, communication, stakeholder and citizen engagement, urban planning, supply and mobility. The certification also applies to renovation projects, although it needs to be further developed in this case. It serves as a framework for a quality assurance instrument for SPENs and can be used during procurement/competition for social housing construction.

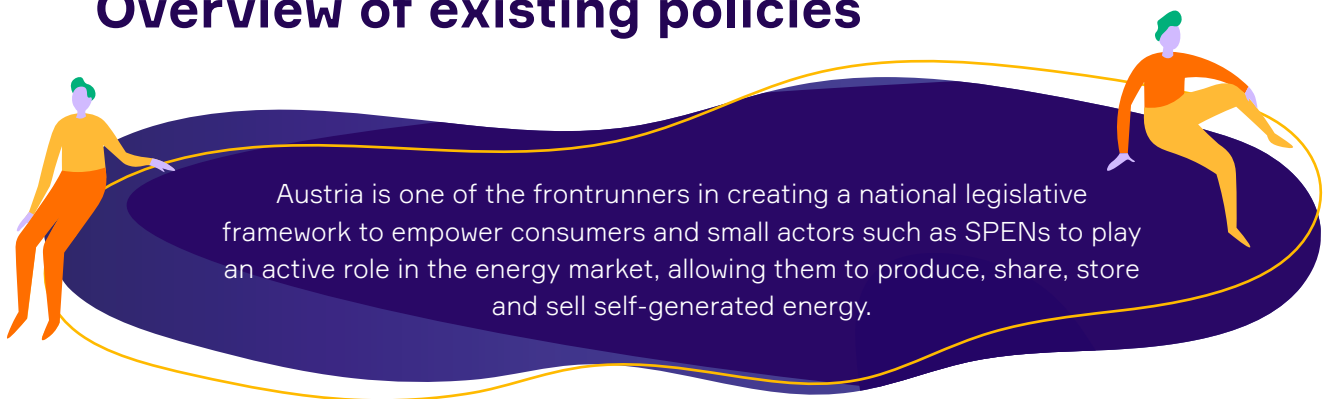


2.

Renewable energy and energy communities

REDII and EMD contain important provisions and definitions for a legal framework to enable the production, storage, sharing and selling of energy. The implementation of these Directives can enable smaller players such as SPENs to play an increasing role in the energy market – and thus in the energy transition. However, Member States opted for a range of strategies and are at different stages in implementing their definitions of collective self-consumption (CSC), renewable energy community (REC) and citizen energy community (CEC). The transposition of these frameworks into national legislation is a key enabler for SPENs.

Overview of existing policies



Austria is one of the frontrunners in creating a national legislative framework to empower consumers and small actors such as SPENs to play an active role in the energy market, allowing them to produce, share, store and sell self-generated energy.

Besides the transposition of the three legal frameworks of CSC, REC and CEC according to the REDII and EMD Directives (Table 4), Austria offers a range of financial incentives such as reduced network charges, taxes and levies (Table 5).

Table 4: Transposition of collective self-consumption and energy communities into national legislation in Austria.

Collective self-consumption (CSC)	Renewable energy community (REC)	Citizen energy community (CEC)
2017 Electricity Act (EIWOG)	2021 Austrian Renewable Energy Act (EAG)	Electricity Industry and Organisation Act 2010 (Modified by the Gazette BGBl. Nr. 150/2021 on 27 July 2021)

CSC was first introduced in Austria in 2017 as part of an amendment to the **Electricity Act (EIWOG)**, and allows private and commercial CSC (such as multi-apartment buildings) to share energy without being registered as a legal entity.

The first definitions of RECs and CECs were introduced by the Electricity Industry and Organisation Act in 2010; however, the frameworks were updated in 2021 with the Austrian Renewable Energy Act (EAG), transposing REDII and EMD provisions. The new EAG established a framework for RECs and came into force in July 2021, while provisions on CECs were introduced to the EIWOG, in addition to the existing CSC scheme that will not be modified. The amendment to the System Charges Ordinance 2021 introduced reductions in grid charges for RECs.

Table 5: Main policy updates (for a complete list of policies relevant for SPENs and renewable energy deployment, see Boll et al. (2021))

Policy	Implementation level	Main provisions
Electricity Industry and Organisation Act 2010 (Modified by the Gazette BGBl. Nr. 150/2021 on 27 July, 2021)	National	Introduction of the concepts of community generating plants, CECs, common provisions for RECs, measurement and billing for RECs. Updated definitions of “supplier”, “market participants” and “participating beneficiary” to include RECs and CECs. CECs may generate electricity and consume or store the self-generated energy.
<u>Renewable Energy Act 2021 (EAG)</u>	National	Promotion of the generation of electricity from renewable sources (increasing renewable electricity production by 27 TWh by 2030). For this goal, the EAG provides a suitable subsidy system. Enables the organisation of RECs and their integration into the funding regulations. Energy communities can be comprised of an association of citizens with local authorities, and small, medium and large-sized businesses.
Spatial Development Concept (REK NEU) 2021	Local	Supports small-scale energy production and the implementation of decentralised district heating. Supports climate adaptation measures to improve the microclimate.

RECs, as opposed to CECs, have physical boundaries and have the obligation to be connected to a local grid (low-voltage) or the regional grid (medium-voltage). RECs need to be located within the territory of a single distribution system operator. The Electricity Act (EIWOG) foresees reduced grid tariffs for electricity sharing in RECs within low and medium voltage levels. Additionally, with the Austrian Renewable Energy Act (EAG) the energy produced and consumed within the community is exempt from financial contributions to the promotion of renewable energy and from tax regulation (Tual et al., 2022).

This combined approach of incentives and limiting the physical boundaries for RECs encourages local self-consumption of the produced electricity and demand-side flexibility (DSF) – and thus it may incentivise SPENs. Some Member States chose to implement RECs within a district or even a municipality boundary; however, choosing grid boundaries instead of administrative ones means additional investments to upgrade grid power can be avoided.

According to the 2021 EAG, RECs will not only be able to generate, store and supply renewable energy but can also act as an aggregator⁸ and provide energy services. RECs can be organised as associations, cooperatives, partnerships or corporations, associations of housing owners or a similar legal body.

The programme of the current government for 2020-2024 (Federal Chancellery of Austria 2020) includes the establishment of one-stop shops for the support of RECs (Frieden et al., 2020). If combined with one-stop-shops promoting energy renovation, this would be a good opportunity to promote the SPEN concept.

Within the syn.ikia SPEN demo in Salzburg an establishment of a REC is planned which would allow the sharing of renewable energy from various sources.

Existing drivers and barriers

Drivers	<ul style="list-style-type: none"> • The national regulatory framework is empowering consumers and small actors such as SPENs to play an active role in the energy market, allowing them to produce, share, store and sell self-generated energy. The definitions of CSC, REC and CEC were transposed according to the REDII and EMD. • Austria offers a range of financial incentives for renewable energy production such as reduced network charges, taxes and levies. • Local production and consumption are encouraged, the REC being limited to physical boundaries of the local grid (low voltage), or the regional grid (medium voltage). It needs to be located within the territory of a single distribution system operator. • Strong leadership from the public sector, with municipalities promoting and participating in RECs. • RECs are not limited to electricity, they can also include heating from various renewable energy sources.
Barriers	<ul style="list-style-type: none"> • RECs require a legal entity, which is a significant barrier for SPENs. Private SPEN developers do not have the capacity to establish a REC, but if available in the SPEN location, a REC provides a good framework for the SPEN for selling excess energy to third parties.

⁸ An aggregator is an energy service provider which can increase or moderate the electricity consumption of a group of consumers according to total electricity demand on the grid and can also operate on behalf of a group of consumers producing their own electricity by selling the excess electricity they produce.



3.

Digital technologies and demand-side flexibility

An adequate policy framework is a prerequisite for a successful implementation of demand-side flexibility (DSF). DSF refers to a mechanism that allows consumers to change their electricity consumption or generation (reduce, increase or shift) for a certain duration based on external signals, such as market price. In this way, they could reduce their exposure to high energy prices, hedge against potential power outages, and monetise their flexible energy use.

Electricity markets need to improve the accuracy of demand-supply forecasts. Thus, the so-called 'imbalance settlement period'⁹ should be set at 15 minutes. This would drive market price balance, and the system would be closer to becoming a real-time electricity market. All smart meters can deliver 15-minute measurements. Previously, yearly net metering¹⁰ was being used as an incentive to encourage investments in renewable energy; however, it does not encourage DSF as the alternative of 15-minute imbalance settlement. DSF is important to reduce peak demands and avoid additional investments in grid upgrades.

Overview of existing policies: existing drivers and barriers

The success of the DSF development will largely depend on i) having demand-side regulation in place, ii) potential market size, iii) the presence of local flexibility mechanisms, and iv) monetisation and the possibility of having markets in the future.

⁹ Imbalance settlement determines the electricity deliveries between the parties operating in the electricity market.

¹⁰ Net-metering an electricity billing mechanism that allows consumers who generate electricity to account it in the billing as used electricity anytime within a certain time period, instead of when it is actually used.

Table 6: Current progress in Austria.
Adapted from Murley & Mazzaferro (2021)



To enable DSF, the regulatory framework must allow aggregators or other companies offering DSF or ancillary services¹¹ to enter the market. An aggregator is an energy service provider which can increase or moderate the electricity consumption of a group of consumers according to total electricity demand on the grid, and it can also operate on behalf of a group of consumers producing their own electricity by selling the excess electricity they produce. DSF and potential bill savings for residential consumers allow for new types of services on the electricity market, provided by aggregators. The new electricity market regulations must therefore allow new companies to enter the market, including in the REC context, at the same time protecting consumers who must ultimately benefit from DSF savings (BEUC, 2018).

¹¹ Ancillary services are additional services provided by the distribution system operator required for a proper operation of the grid such as keeping the frequency, voltage, and power load within certain limits.

Sustainable plus energy neighbourhoods



Potential market size of flexibility

Electricity markets encompass many ancillary services, which can create revenue opportunities. These ancillary services need to exist in the local market; the regulation needs to enable a dynamic and flexible market with no double network charges, and to enable the aggregation of resources.



Local flexibility and energy communities

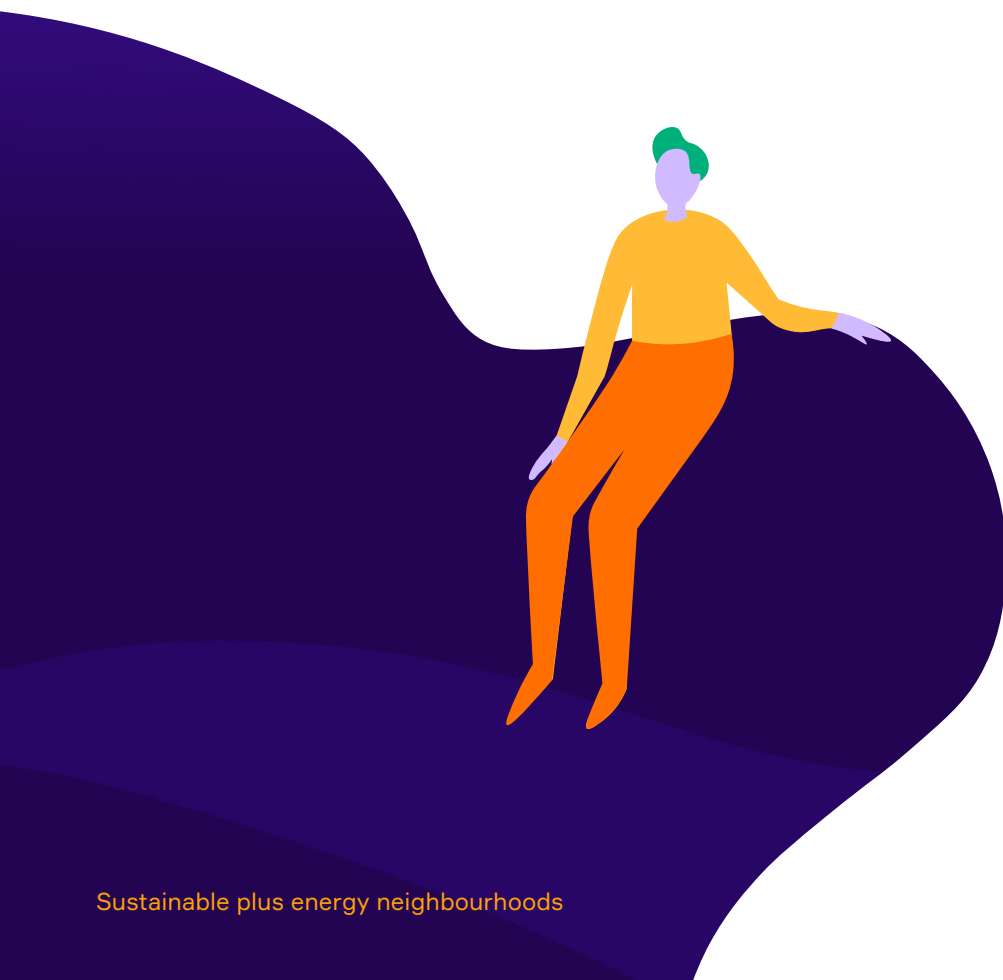
The regulatory framework should also enable energy production, sharing and selling of excess of energy by transposing the CSC, REC and CEC into national legislation. The CSC is limited to a single property and should be further developed. Austria is one of the frontrunners in implementing the REDII and EMD provisions on RECs and CECs, providing a clear legal framework for SPENs to operate in relation to other market players. The definition of RECs within the local grid (low voltage), or the regional grid (medium voltage) encourages DSF. Within a REC, prosumers are exempted from consumption-based grid fees if operating within low or medium-voltage grid levels. They also benefit from the removal of consumption-based renewables surcharges. There are no limitations on the maximum capacity for RECs.



Future of flexibility

The progress of policies in terms of future targets for renewables or target dates to join European market coupling is assessed in Table 6, as well as the current monetisation of flexibility. According to the Electricity Act (ElWOG), the distribution system operator is responsible for collecting metering data at an interval of 15 minutes when using smart meters. Data from smart metering is stored and can be viewed by consumers (Tual et al., 2022). The 15-minute imbalance settlement encourages local self-consumption at the moment of production, thus contributing to DSF. However, the 15-minute metering is not by default: consumers must opt in, which can hinder its implementation because of consumer concerns regarding costs and data privacy.

Drivers	<ul style="list-style-type: none"> • Austria is a frontrunner in implementing REC and CEC frameworks. • RECs have a physical boundary limited to low or medium grid levels and lower grid tariffs. • SPENs have more potential for DSF than single apartments because of shared assets such as shared heat pumps, PV panels, EV charging, EVs and bicycles. This allows for business models similar to aggregators but managing both electricity and heating. • 15-minute imbalance settlement within RECs further encourages local consumption of energy and DSF. • Austria is a frontrunner in testing and implementing the SRI as a voluntary certification for smartness in buildings.
Barriers	<ul style="list-style-type: none"> • The optimisation of electricity and heat production requires complex modelling and automation, meaning costly investments in smartness and an energy manager within a SPEN. • There is a lack of information for homeowners on price fluctuations. • The 15-minute imbalance settlement within the REC is not mandatory, consumers must actively opt in. • SRI is developed at building scale and needs to be adapted for the neighbourhood approach.





4.

Financing, business models and enabling conditions

The low energy demand and the surplus of energy of a SPEN offers new business model opportunities for energy sharing within SPENs, as well as selling the excess energy within a REC. The business models (Table 7) were analysed in a workshop with experts and developers, to assess their applicability to existing SPENs and their alignment with the existing regulatory framework (Table 8).

Table 7: Overview of potential business models relevant for SPENs

Business model	Description	Relevance for SPENs
P2P or local electricity market	Promote collective self-consumption by creating a marketplace among prosumers and consumers.	Energy sharing system among positive energy buildings in a SPEN. It incentivises and rewards plus-energy buildings. It encourages the community as a whole to share electricity and achieve a potential net gain.
Joint shared assets	Shared energy assets and investments such as batteries, PV panels etc.	Assesses the added value of SPEN projects compared to business as usual. Determines the optimal investments and the source of revenues to pay these (individual, collective, or both).
SPEN as an energy retailer	The SPEN becomes a retailer that buys power directly from wholesale markets, hence reducing costs by avoiding an intermediary (currently retailers).	Assuming that an advanced energy management system is available in the SPEN, automatises the hourly energy balance and predicts demand commitments in the power market. It brings advantages including more choices of energy suppliers and independence from retailers. This challenges the status quo and has the potential to channel more revenues to consumers, by avoiding the transaction costs of a retailer.

Business model	Description	Relevance for SPENs
PPA	Power purchase agreements. Green or zero-carbon-emission energy might be of interest for industry or public buildings to certify guarantees of origin.	PPAs offer the possibility of a long-term commitment to sell surplus energy from SPENs to external players interested in acquiring certified renewable energy.
Inter-SPEN	The surplus energy of a SPEN can be traded or offered to an open marketplace, for example within a REC.	Trading surplus energy outside SPENs may incentivise additional investments in energy efficiency and renewable energy. Surplus energy could be bought by aggregators, other neighbourhoods or SPENs, industry, retailers etc. RECs and CECs may enable small actors such as SPENs to enter the electricity market.
SPEN flexibility services	Business models based on DSF: shifting demand according to energy availability to reduce peak loads and reduce grid congestion. The DSF avoids additional investments in grid upgrades.	SPENs provide energy flexibility to external actors: distribution system operators, aggregators, local grids, EV smart charging etc. The SPEN, through the energy management system, engages in DSF that has to be monetised and brings financial benefits to the consumers.

Table 8: Applicability of business models for SPENs in Austria and regulatory frameworks necessary

Business model	P2P or local electricity market	Joint shared assets	SPEN as retailer	PPA	Inter-SPEN	SPEN as retailer
Applicability of business models for SPENs in Austria	✓	✓	✓	✓	✓	✓
Regulatory framework requirements	CEC and CSC	REC and CSC	CEC	REC	CEC and REC	CEC and REC

The social housing sector represents an important share of the Austrian building stock, and it has set a goal to increase the energy efficiency of its stock. Subsidies are proportional to the energy rating achieved by the project. The syn.ikia SPEN demo in Salzburg is a social housing project consisting of a mix of new construction and renovation. Given the relative size of the social housing sector, it can play an important role in the first phase of financing and testing the SPEN concept, until it becomes mature enough to be taken up by other parts of the housing market.

The syn.ikia SPEN demo in Salzburg is **Klimaaktiv** certified, which means it also considers visual and acoustic comfort, and social aspects of sustainability such as participatory processes and mobility. The Austrian demo project implemented a car-sharing scheme, shared parking and for bikes, and it implemented changes regarding access to public mobility by adding an additional stop.

SPENs have a strong focus on social cohesion and community building, as well as the comfort and wellbeing of tenants. The pilot in Austria offers additional services for those with special needs such as people with disabilities and the elderly, in collaboration with existing NGOs and initiatives in the neighbourhood. The project also integrates a kindergarten.

Certification schemes such as Klimaaktiv can be tools to quantify these aspects of social sustainability. Klimaaktiv also evaluates the use of materials and thus can contribute to a reduction in embodied carbon emissions by increasing the use of secondary, recycled or biobased materials. The added value of Klimaaktiv over similar certification schemes is that it gives the possibility to certify both individual buildings and neighbourhoods.

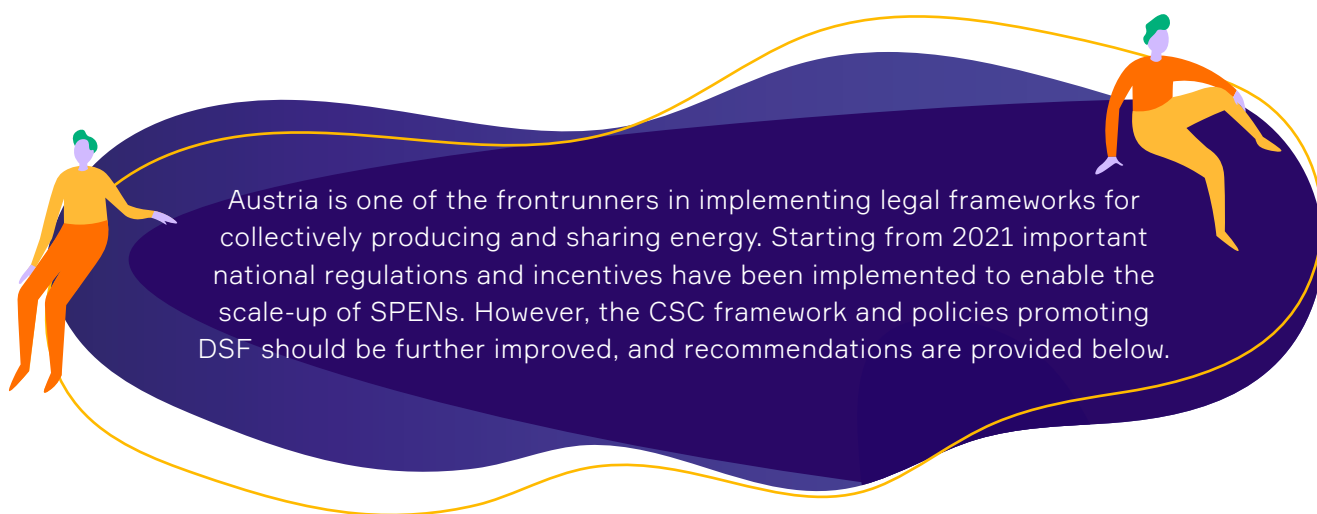
The demo in Salzburg additionally used **GREENPASS® | enabling livable cities**, which is a decision-support tool that helps project developers predict different temperature scenarios based on the surfaces and materials in an urban area.

These certification schemes can attest the added values of SPEN developments compared to business as usual, and become a source of verified documentation to support compliance with sustainable finance claims (taxonomy) and the articulation of the business case for SPENs.



5. Policy recommendations for Austria

Reducing energy demand at the building level for new constructions and renovations plays an important role in the total energy balance of a SPEN. Important progress through implementing the 2018 EPBD increased the ambition of minimum requirements to NZEB levels. The next steps towards achieving zero-emission building stock by 2050 will be set up in the upcoming revised EPBD of 2023.



Austria is one of the frontrunners in implementing legal frameworks for collectively producing and sharing energy. Starting from 2021 important national regulations and incentives have been implemented to enable the scale-up of SPENs. However, the CSC framework and policies promoting DSF should be further improved, and recommendations are provided below.

Energy performance	<ul style="list-style-type: none"> ● After the implementation of NZEB standards, the upcoming implementation of zero-emission building standards of the revised EPBD should further increase the ambition for new constructions and renovations, considering the embodied carbon. ● Support schemes are necessary to encourage additional investments in positive energy buildings, beyond minimum requirements. ● Incentives and financing schemes should gradually evolve to require lifecycle carbon assessment and reductions.
Renewable energy and energy communities	<ul style="list-style-type: none"> ● The CSC framework should be further improved. Currently, CSC is limited to electricity, while sharing energy within a SPEN requires a framework that includes renewable heating and cooling. ● CSC must be extended beyond the building, similar to the implementation of CSC in other Member States such as France and Spain, which implemented CSC within a range of 2km. CSC does not require a legal entity like RECs, and it provides a good framework for sharing energy within a SPEN. ● The establishment of one-stop shops to support RECs could be combined with one-stop-shops promoting energy renovation. This would be a good opportunity to promote the concept of SPENs.
Digital technologies and demand-side flexibility	<ul style="list-style-type: none"> ● Within RECs, the 15-minute imbalance settlement has to be set by default to encourage DSF. ● Provide easy entry to companies offering additional services to SPENs in terms of DSF, such as aggregators or energy managers in the market and their engagement with residential consumers. ● In testing and implementing the SRI, the current building level method should be adapted for the neighbourhood level for certifying SPENs.

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