islander

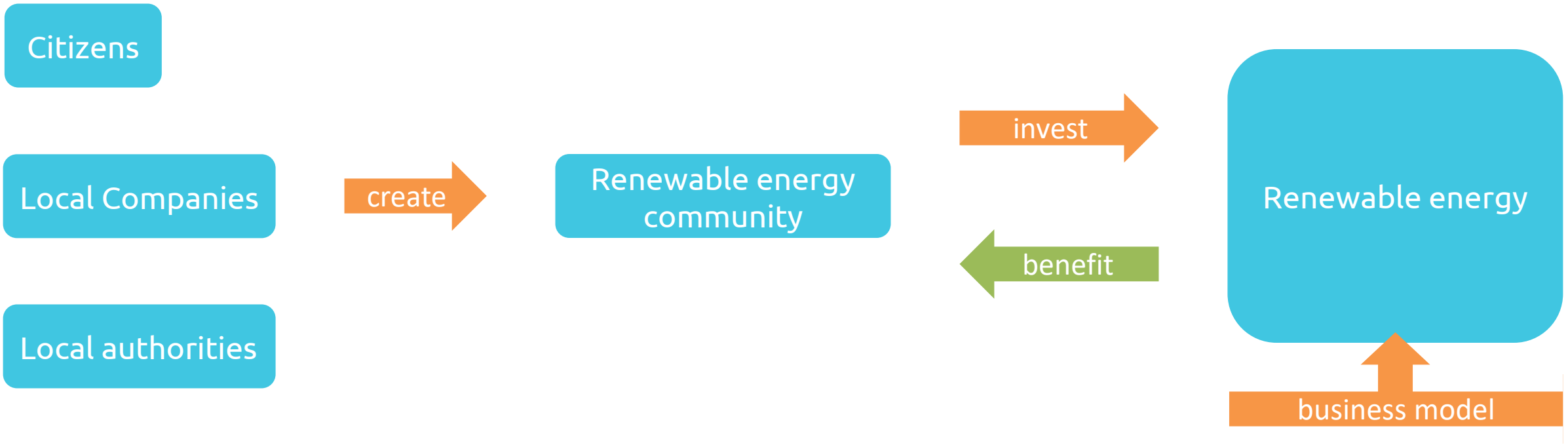
Funding Islands Decarbonization Through Community Owned Energy

Manuel Selinsek, Steinbeis Europa Zentrum, 09.09.2022

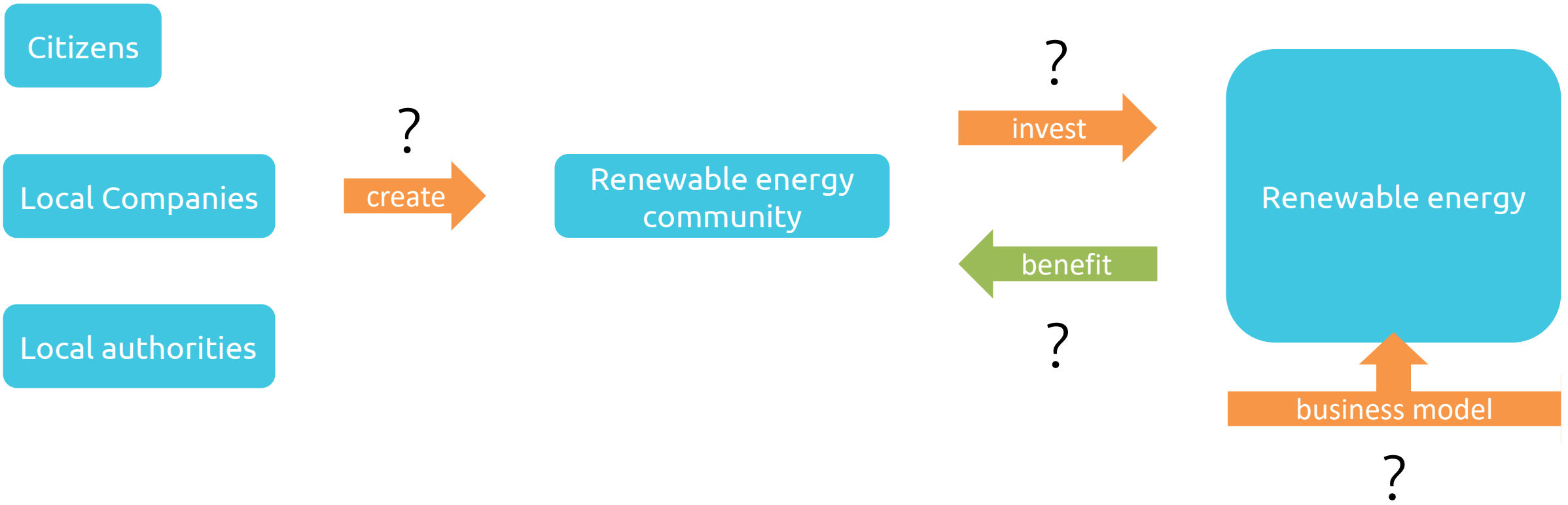
Steinbeis Europa Zentrum
Enabling Innovators to Grow

SUSTAINABLE PLACES 2022
Sep. 6 - Sep. 9, 2022 | Nice, France

This project has received funding from the European Union's Horizon 2020 research and innovation under grant agreement No 957669



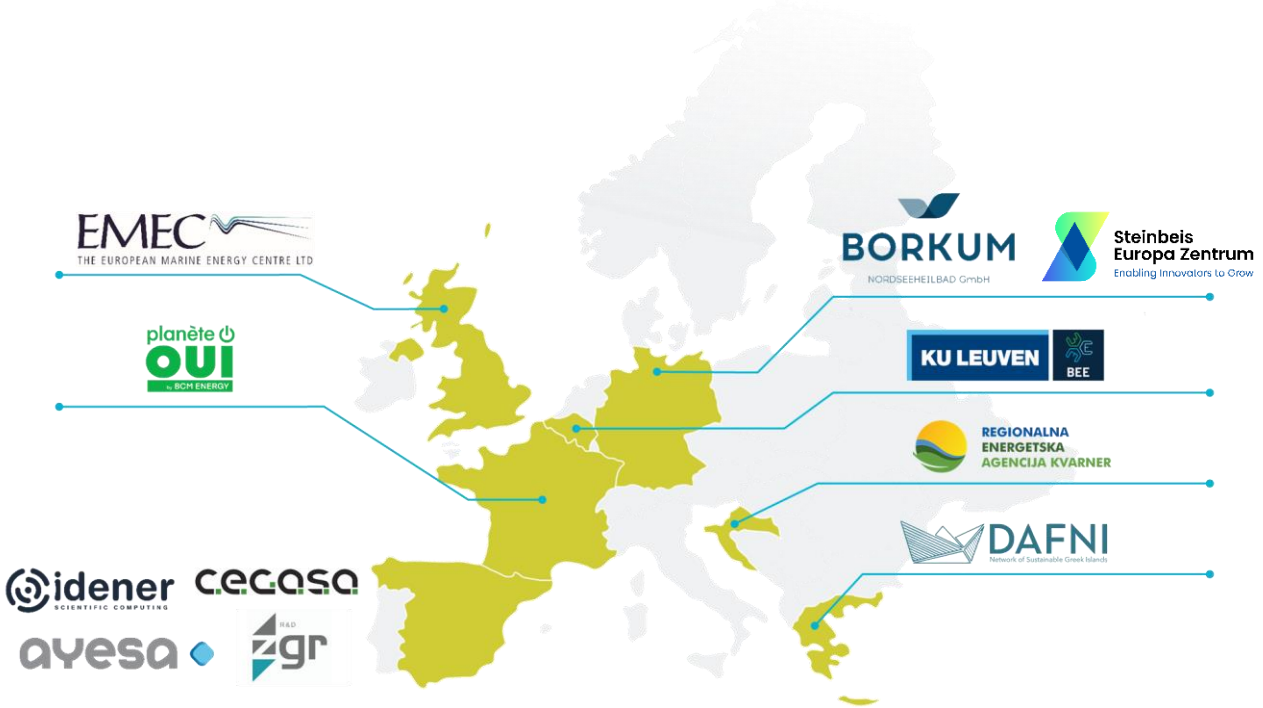
manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de

ISLANDER EU PROJECT is a H2020 innovation action involving 11 organisations from 7 EU countries, including 5 islands

- Demonstration of smart grid solutions in operational environment on Borkum island
- Project duration: 4 years from October 2020 – September 2024
- 7 EU countries represented by 11 organisations: research centres, SMEs, and large enterprises
- About € 8,3M total budget, co-funded with € 7M by the European Commission
- 4 followers islands: Cres (Croatia), Lefkada and Skopelos (Greece), Orkney (UK)



https://islander-project.eu/

manuel.selinsek@steinbeis-europa.de

islander

ISLANDER EU PROJECT will develop a smart energy management solution aggregating distributed energy resources and implement it on Borkum.

- Hardware demonstration
- PV + battery household and building solutions
- Short-to-seasonal electricity storage
- Sea water district heating
- EV charging network
- Software demonstration
- Smart IT platform
- Demand response app
- Forecasting
- Supporting actions
- Replication
- Renewable energy community
- Communication, dissemination, exploitation

https://islander-project.eu/

manuel.selinsek@steinbeis-europa.de

ISLANDER EU PROJECT will develop a smart energy management solution aggregating distributed energy resources and implement it on Borkum.

- Hardware demonstration
- PV + battery household and building solutions
- Short-to-seasonal electricity storage
- Sea water district heating
- EV charging network

Software demonstration		Supporting actions	Steinbeis Europa Zentrum (Enabling Innovators to Grow)
Smart IT platform	Support	Replication	Support
Demand response app	Support	Renewable energy community	WP lead
Forecasting		Communication, dissemination, exploitation	WP lead

https://islander-project.eu/

manuel.selinsek@steinbeis-europa.de

ISLANDER will facilitate the creation of a renewable energy community on the pilot island Borkum

Preparation of **materials and messages**

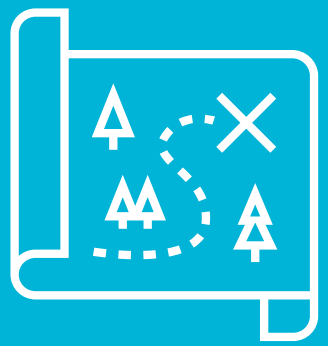
Direct contact of main stakeholders

Informing the citizens and tourists through local media

Series of **workshops** bringing all stakeholders together

Technical feasibility and **economical viability** study

Roadmap for the creation of the Renewable Energy Community



https://islander-project.eu/

manuel.selinsek@steinbeis-europa.de

ISLANDER will facilitate the creation of a renewable energy community on the pilot island Borkum

done

Preparation of **materials and messages**

next

Direct contact of main stakeholders

next

Informing the citizens and tourists through local media

next

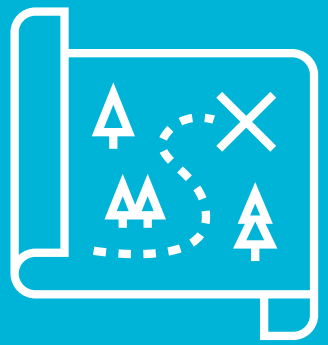
Series of **workshops** bringing all stakeholders together

next

Technical feasibility and **economical viability** study

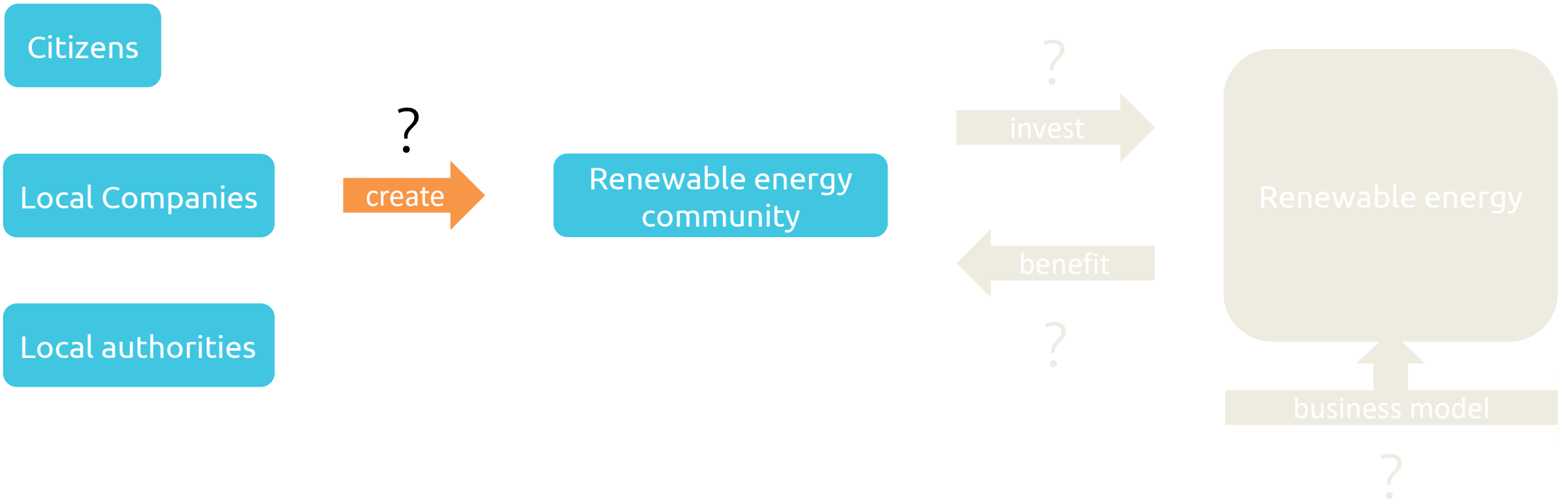
End of project

Roadmap for the creation of the Renewable Energy Community



https://islander-project.eu/

manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de

"Energy communities organise collective and citizen-driven energy actions that help pave the way for a clean energy transition." - European commission

Definition by RED II

Renewable energy community' means a legal entity:

- which, in accordance with the applicable national law, is based on **open and voluntary participation**, is **autonomous**, and is effectively controlled by shareholders or members that are **located in the proximity** of the renewable energy projects that are owned and developed by that legal entity;

- the shareholders or members of which are **natural persons, SMEs or local authorities**, including municipalities;

- the primary purpose of which is to **provide environmental, economic or social community benefits** for its shareholders or members or for the local areas where it operates, rather than financial profits;

manuel.selinsek@steinbeis-europa.de

In the upcoming EEG 2023 (§ 3 No. 15), the term "citizens' energy communities" (BEG) will be legally defined

EEG defines:

- **Nr. of natural persons:** at least 50 natural persons with voting rights
- **Share of domestic natural persons:** At least 75 percent of the voting rights are held
- **Share of remaining participants:** maximum of 25 percent of the voting rights are held by SMEs or local authorities.

  (SMEs: < 250 employees, < 50 million euros in turnover or < 43 million euros in total assets)
- **Distribution of voting rights:** No member or shareholder is allowed more than 10% of the voting rights
- **Influence on decisions:** Opportunity to influence decisions of the shareholders' meeting mandatory
- **More:** Rules apply if several actors join together “energy community of energy communities”

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

Citizen energy communities benefit from German law.

Benefits:

- Realization without tendering process reduces efforts:
  - PV projects (groundmounted or on built-structures) up to 6 MW
  - Wind energy projects up to 18 MW
- Additional grants for planning and permission of wind energy projects expected

Downsides:

- However, only one solar plant or a wind project can be realized once every five years.
- Lack of implementation of energy sharing as provided for in the European law.

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

Most common legal form for energy communities in Germany is the cooperative (eG), it is safe and that allows equal voting rights for all participants.

	Cooperative
Objective	Facilitate economical, social and cultural interests of the members
Foundation	• Articles of association in written form • Incorporation audit • Entry in the register of cooperatives
Shareholder liability	• Limited to cooperative share
Advantage	• Voting rights for all participants • Safe due to audit
Disadvantage	• Complex foundation

Only applies to Germany!

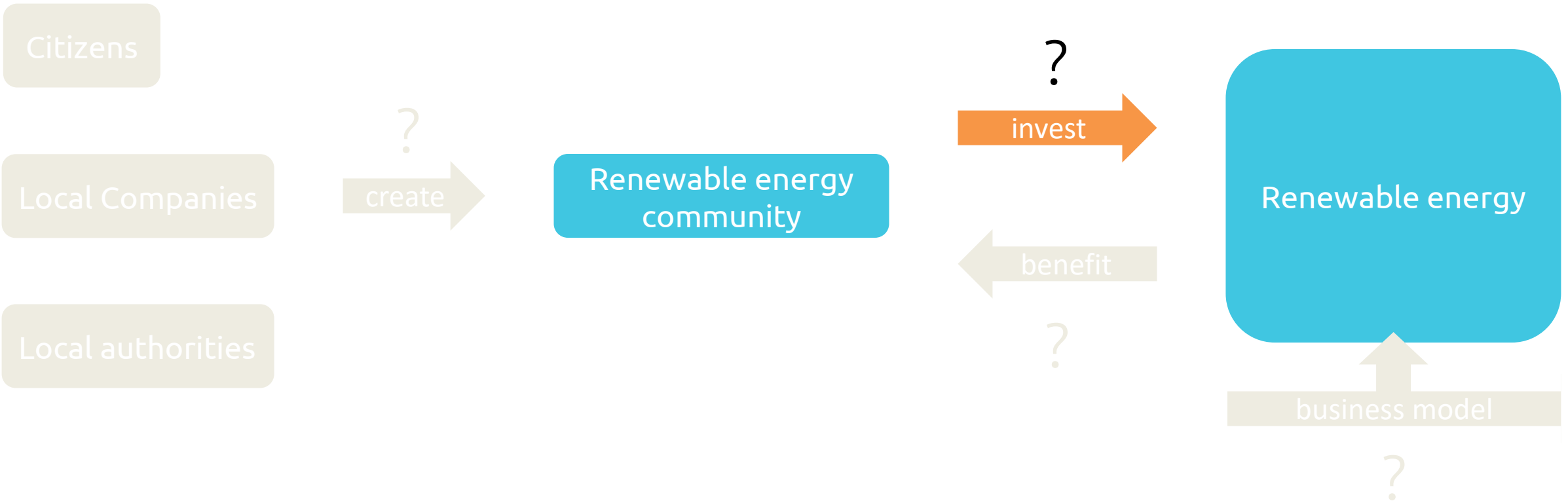
manuel.selinsek@steinbeis-europa.de

Most common legal form for energy communities in Germany is the cooperative (eG), it is safe and that allows equal voting rights for all participants.

	Cooperative	GmbH & Co. KG
Objective	Facilitate economical, social and cultural interests of the members	Operation of a commercial enterprise by equal partners
Foundation	• Articles of association in written form • Incorporation audit • Entry in the register of cooperatives	• Informal or written partnership agreement • Registration in the Trade Register
Shareholder liability	• Limited to cooperative share	• Limited to the capital of the company
Advantage	• Voting rights for all participants • Safe due to audit	• Suitable for different shareholder interests
Disadvantage	• Complex foundation	• High formalities due to the two forms of company • Voting rights limited to management

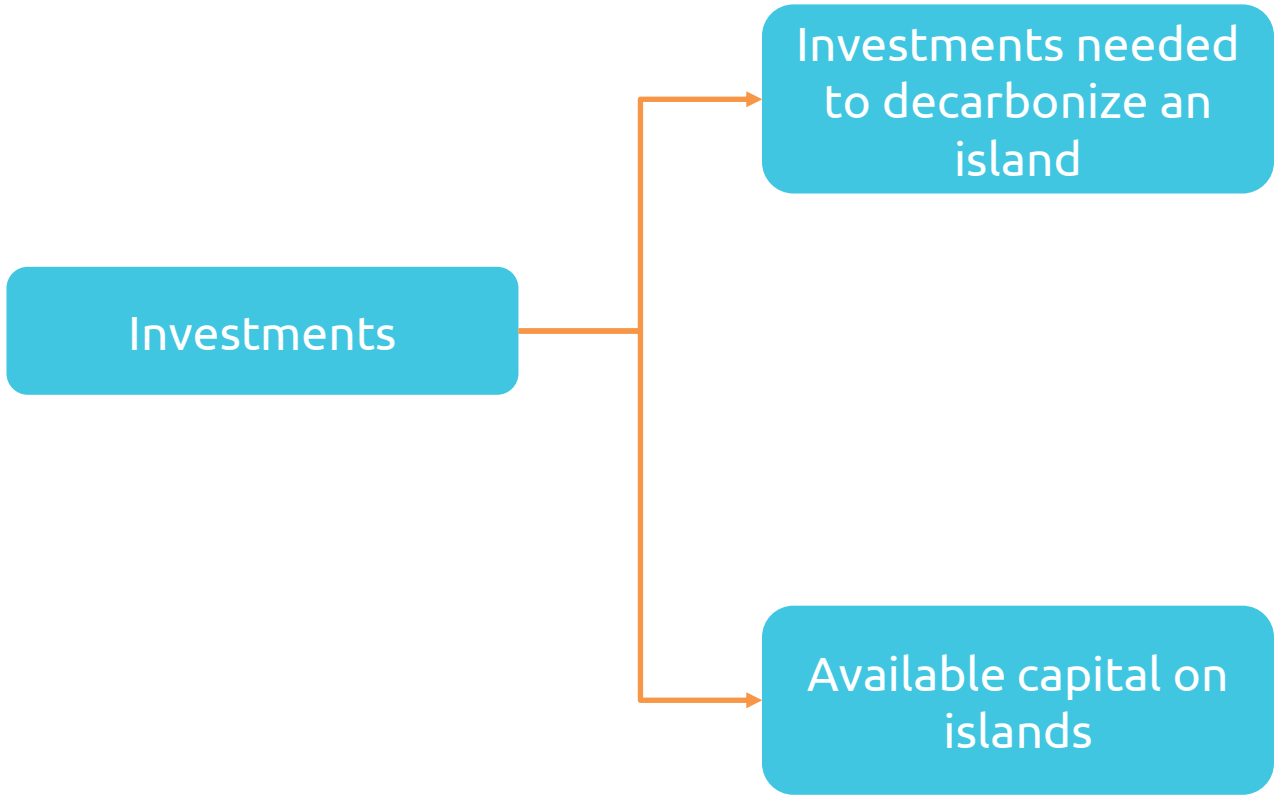
Only applies to Germany!

manuel.selinsek@steinbeis-europa.de



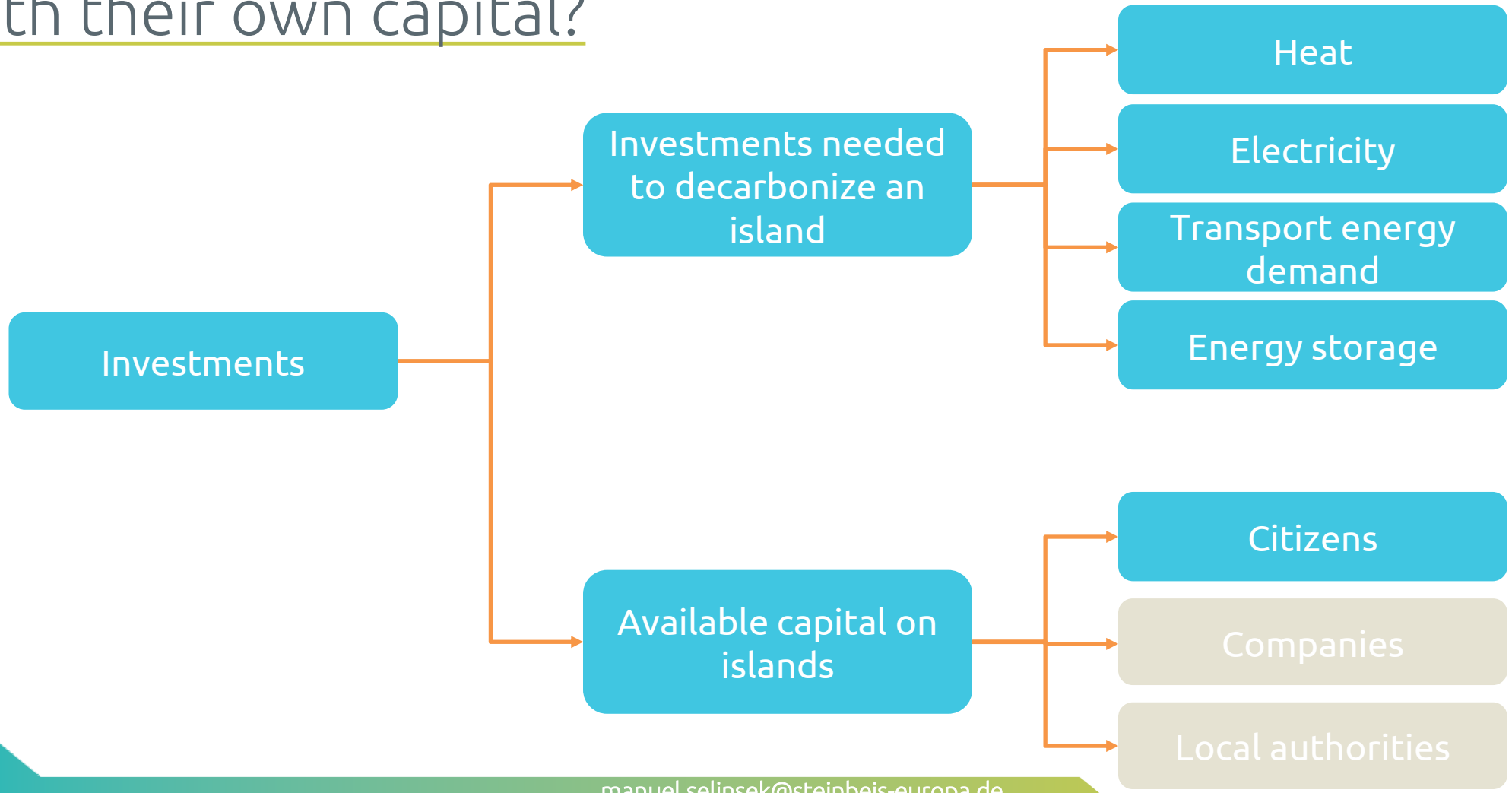
manuel.selinsek@steinbeis-europa.de

Can citizens significantly facilitate decarbonisation on islands with their own capital?



manuel.selinsek@steinbeis-europa.de

Can citizens significantly facilitate decarbonisation on islands with their own capital?



manuel.selinsek@steinbeis-europa.de

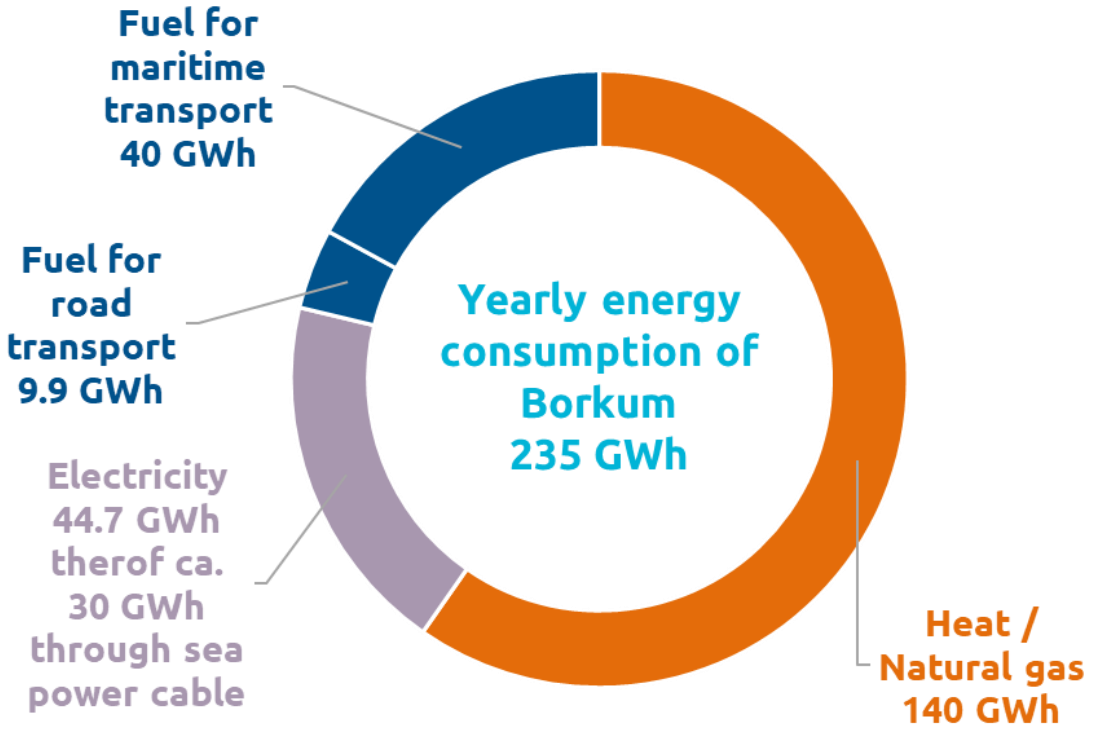
ISLANDER's pilot island Borkum uses 60% of the energy for heat production and over 90% of energy is imported

Location	North Sea – German North-West coast
Area	31 km²
Number of inhabitants	5,500 permanent residents and over 25,000 during tourist season in summer

manuel.selinsek@steinbeis-europa.de

ISLANDER's pilot island Borkum uses 60% of the energy for heat production and over 90% of energy is imported

Location	North Sea – German North-West coast
Area	31 km²
Number of inhabitants	5,500 permanent residents and over 25,000 during tourist season in summer



manuel.selinsek@steinbeis-europa.de

3.8 – 14.3 % of required capital can directly come from citizens

	Heat	Electricity	Transport energy demand	Storage	Total
Capacity needed	140 GWh 35 – 47 $GWh_{elec.}$	44.7 GWh 88.2 – 122.9 GWh	8.5 – 31.5 GWh	0.24 – 2.0 GWh	
Main assumption	Heat pumps COP 3-4 Estimated costs from external study	1 €/kWh	1865 cars, 272 trucks, 331 motorcycles 3250 – 7500 km/a Maritime = 4-8 x road	1 – 6 times daily average demand; 100 – 250 €/kWh	
Estimated costs	85 - 111 M€	88.2 – 122.9 M€	Included in electricity costs	24.2 – 504.9 M€	197 – 738 M€

manuel.selinsek@steinbeis-europa.de

3.8 – 14.3 % of required capital can directly come from citizens

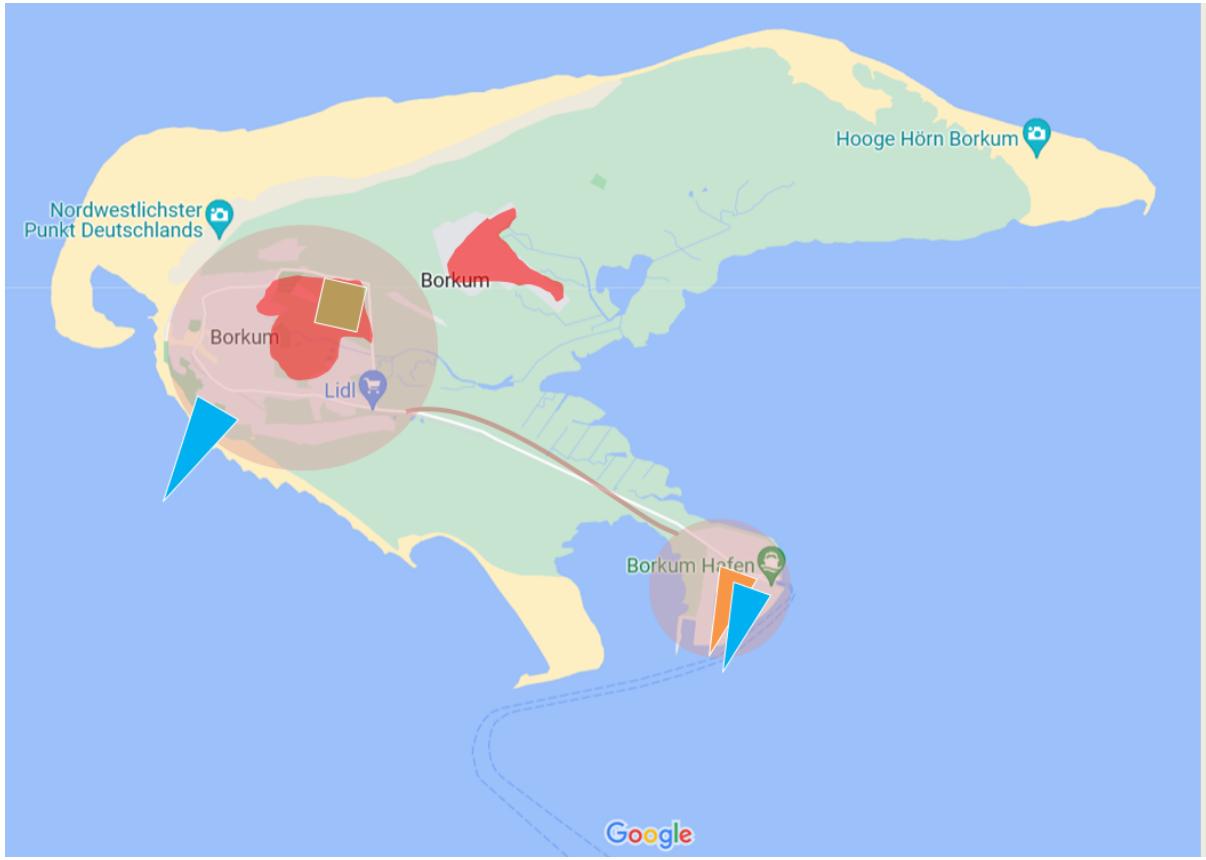
	Heat	Electricity	Transport energy demand	Storage	Total
Capacity needed	140 GWh 35 – 47 $GWh_{elec.}$	44.7 GWh 88.2 – 122.9 GWh	8.5 – 31.5 GWh	0.24 – 2.0 GWh	
Main assumption	Heat pumps COP 3-4 Estimated costs from external study	1 €/kWh	1865 cars, 272 trucks, 331 motorcycles 3250 – 7500 km/a Maritime = 4-8 x road	1 – 6 times daily average demand; 100 – 250 €/kWh	
Estimated costs	85 - 111 M€	88.2 – 122.9 M€	Included in electricity costs	24.2 – 504.9 M€	197 – 738 M€

Potential citizens' capital	5,500 permanent residents	5,164 € avg. contribution	28.4 M€

Source: www.dgrv.de

manuel.selinsek@steinbeis-europa.de

Reneweable energy technologies have great potential on Borkum. However, renewable electricity consumption will likely increase by a factor of 2 - 3 and create a bottle neck.



A **heating network** can be the backbone of renewable heating supply on Borkum

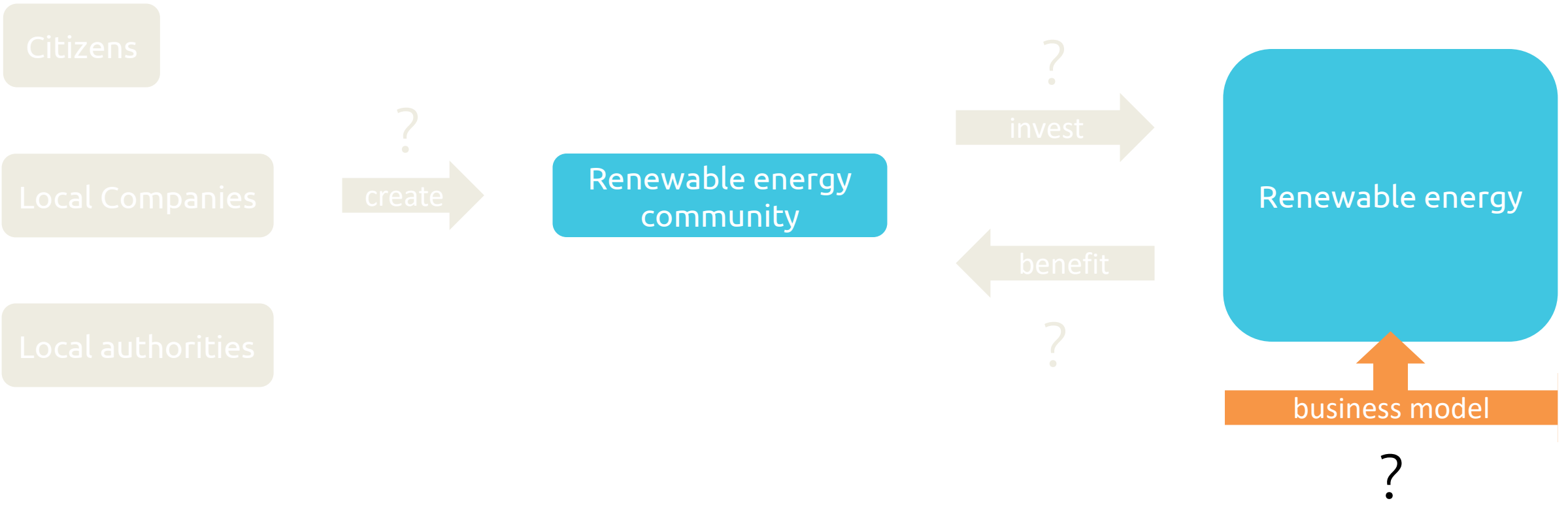
Sea water heat pumps offer an inexhaustible source of heat

Geothermal energy could cover ca. 60 % of annual heating requirements

Solar thermal energy can cover all heating during summer and **PV energy** can cover over 50 % of current electricity needs

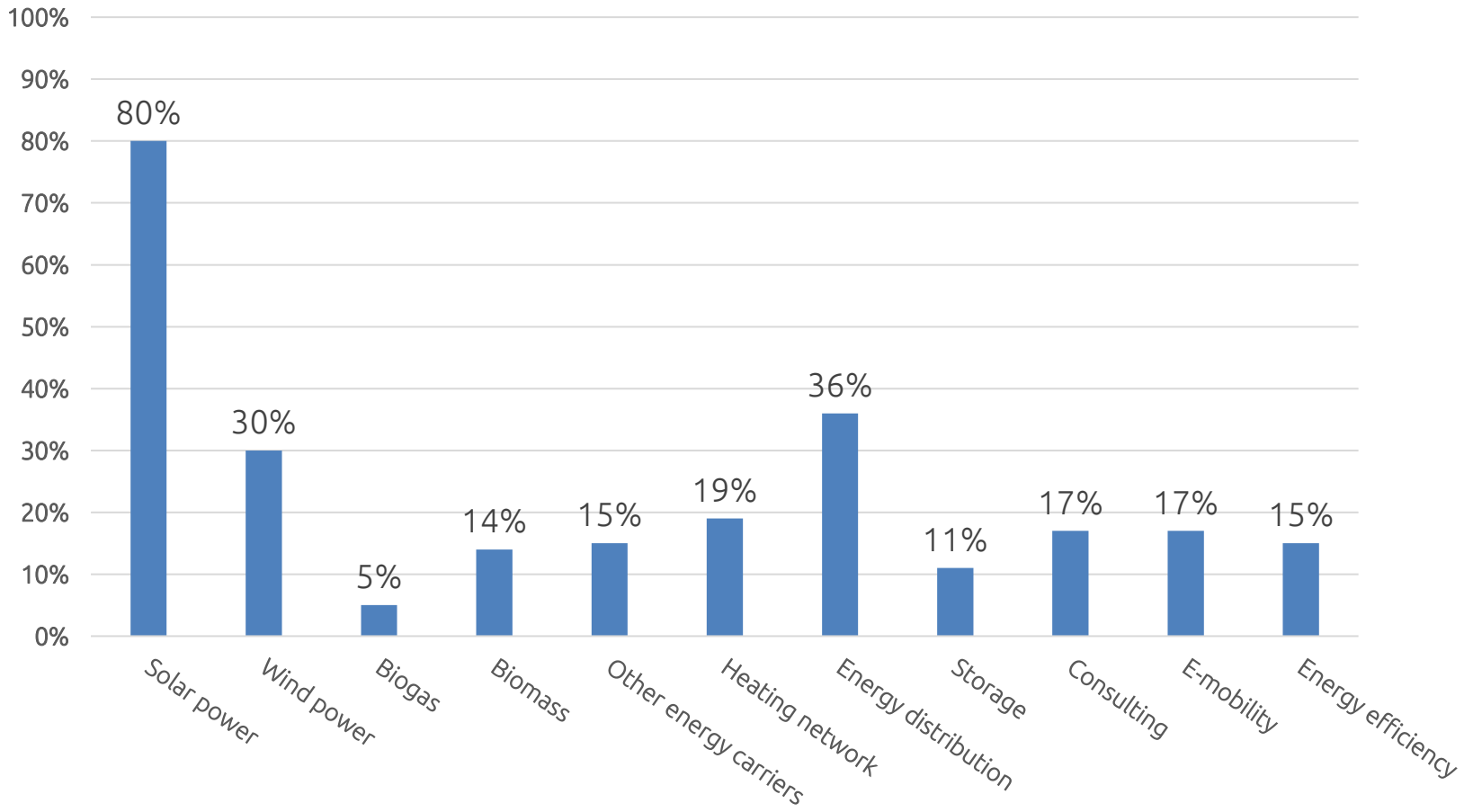
Air Source HP, CHP and Hydrogen energy storage can fill gaps and stabilize the overall system.

manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de

The main business of energy communities in Germany is energy generation and distribution.



Source: www.dgrv.de

manuel.selinsek@steinbeis-europa.de

Two main business models exist for renewable energy generation in Germany, feed into electricity grid or landlord-to-tenant electricity

Feed-in

Landlord-to-tenant

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

Two main business models exist for renewable energy generation in Germany, feed into electricity grid or landlord-to-tenant electricity

	Feed-in	Landlord-to-tenant
Description	Renewable electricity is fed into the electricity grid and the producer receives a fixed feed-in tariff	
Pro	Guaranteed offtake for defined feed-in tariff in long term contracts	
Con	Fixed price defines feasibility	

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

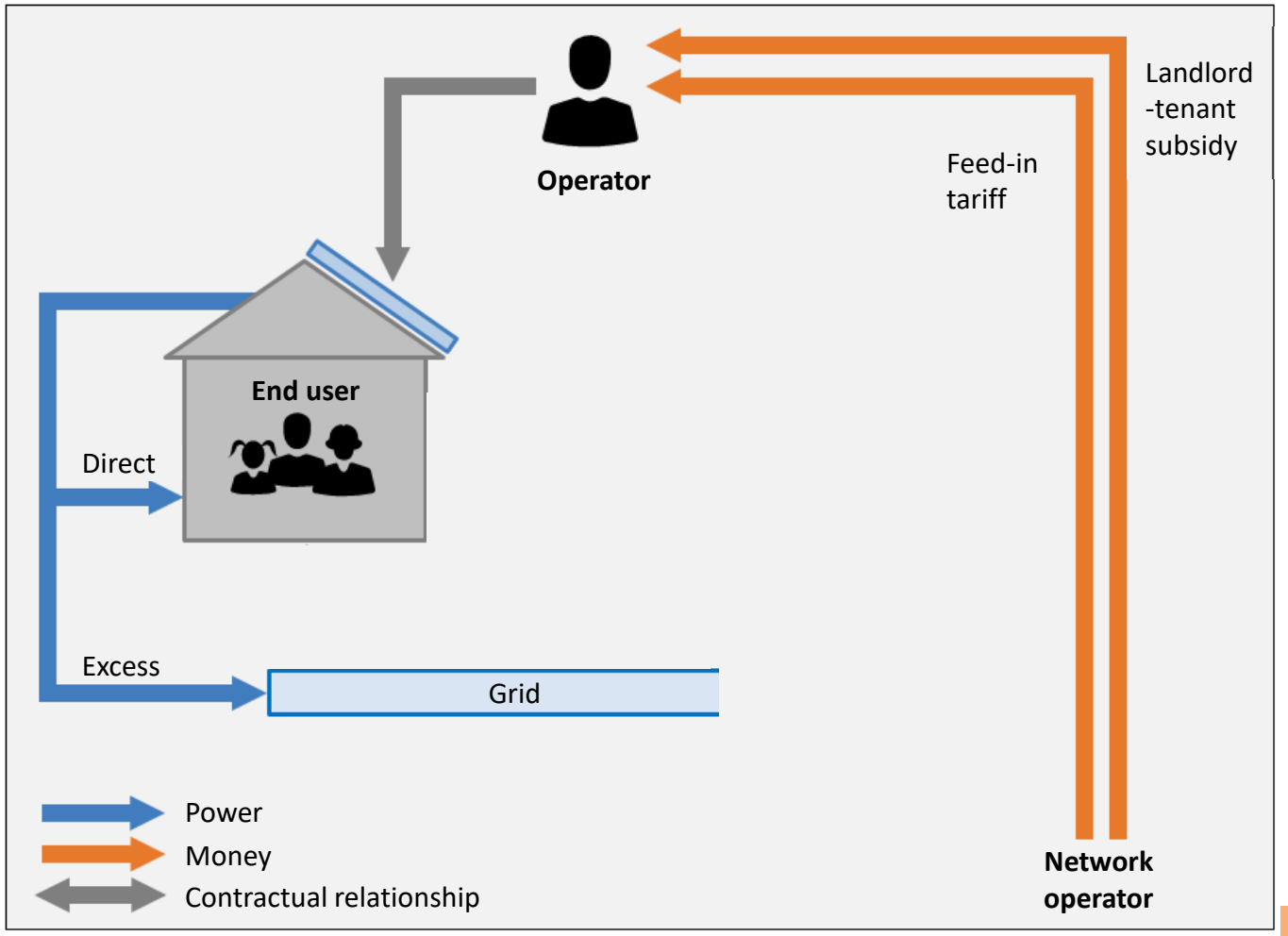
Two main business models exist for renewable energy generation in Germany, feed into electricity grid or landlord-to-tenant electricity

	Feed-in	Landlord-to-tenant
Description	Renewable electricity is fed into the electricity grid and the producer receives a fixed feed-in tariff	Renewable energy is produced and consumed without using the grid. A contract between landlord and tenant defines the tariff.
Pro	Guaranteed offtake for defined feed-in tariff in long term contracts	Grid fees, electricity tax and other fees bound to usage of the grid do not apply. Certain freedom of pricing.
Con	Fixed price defines feasibility	Subsidies in Germany only available for residential properties. Complex contractual relationships.

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

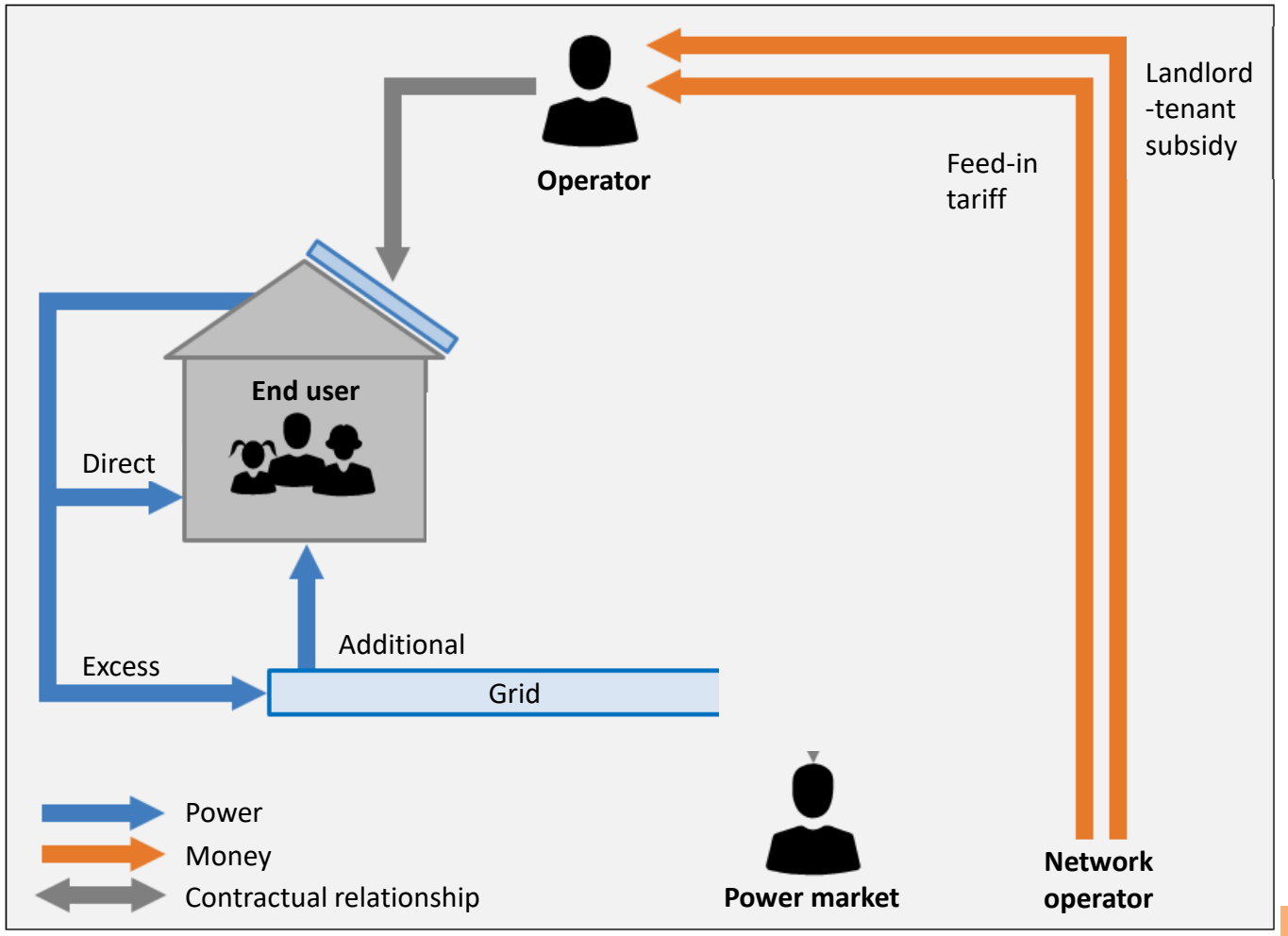
Landlord-to-tenant electricity requires complex contractual relationships



Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

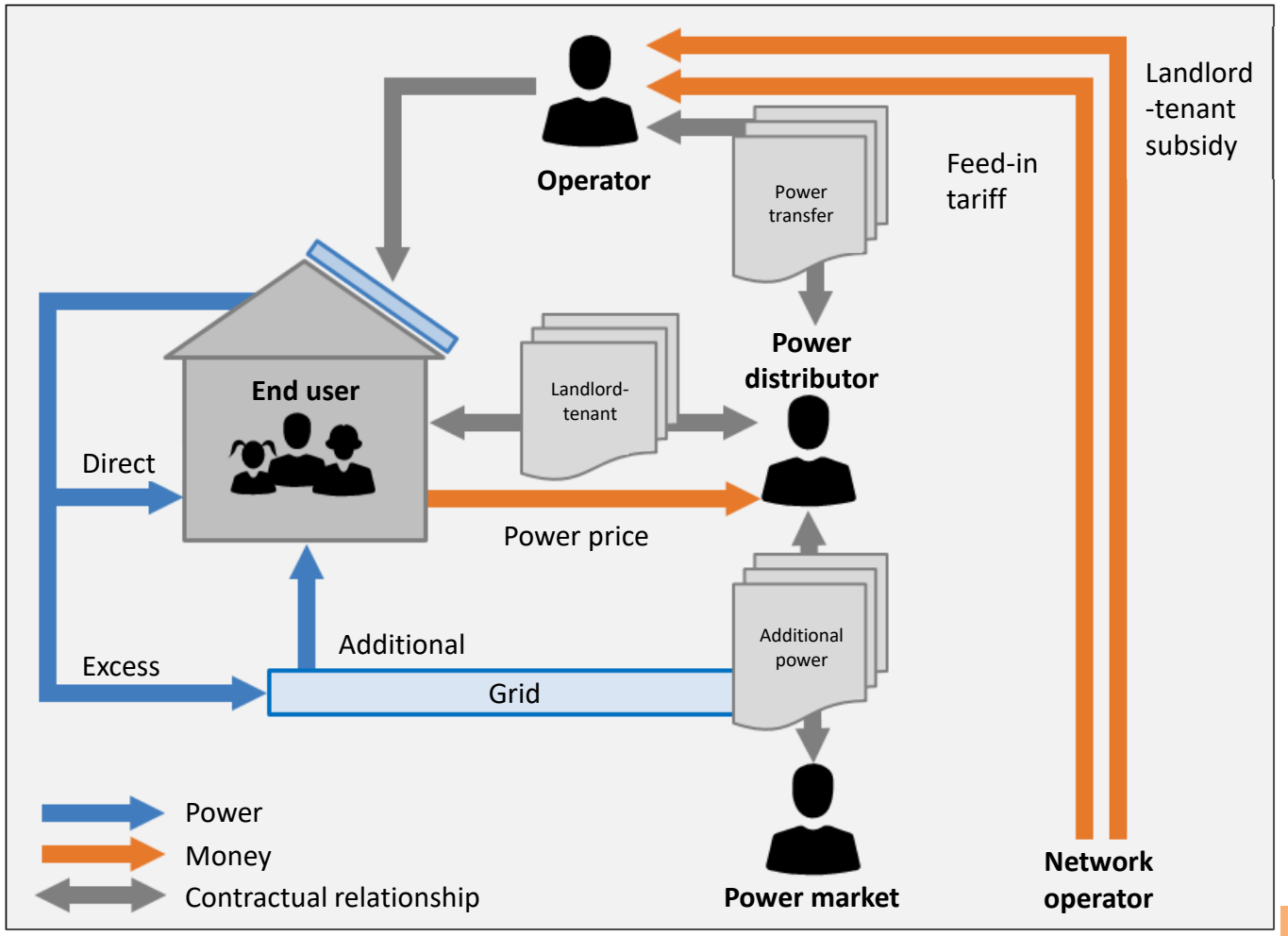
Landlord-to-tenant electricity requires complex contractual relationships



Only applies to Germany!

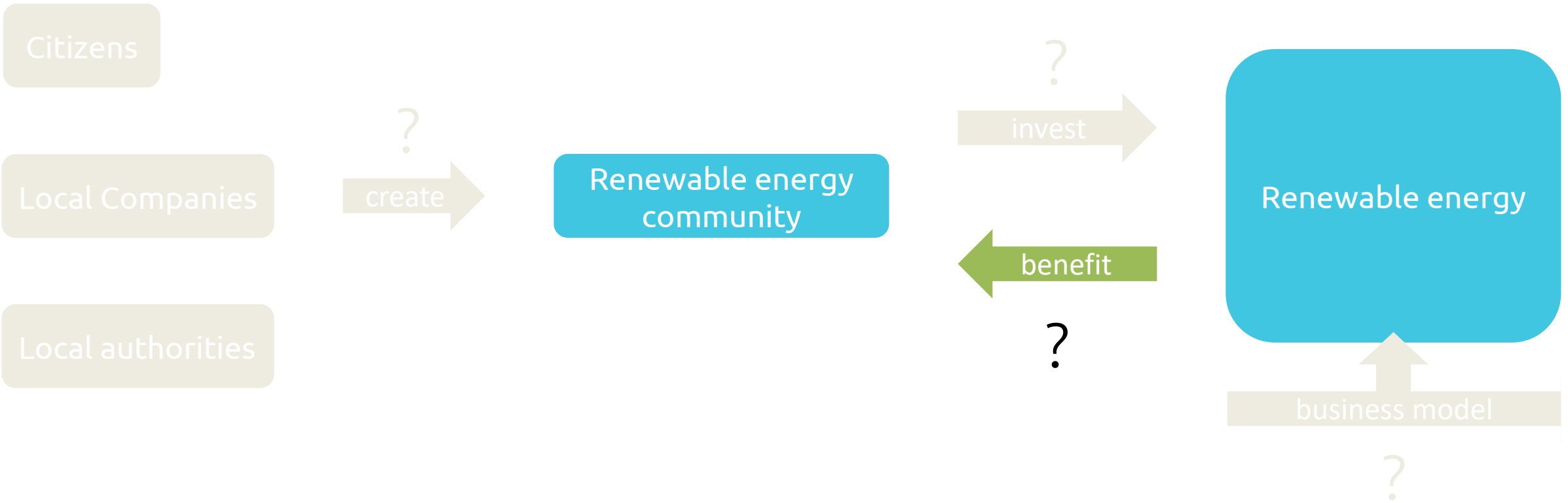
manuel.selinsek@steinbeis-europa.de

Landlord-to-tenant electricity requires complex contractual relationships



Only applies to Germany!

manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de

Economical feasibility and benefits are mainly defined by the renewable energy law in Germany

Feed-in

- Feed-in tariff of 6.2 – 13.4 cent/kWh if all power is fed into grid
- Feed-in tariff of 6.2 – 8.6 cent/kWh for partial feed-in
- (likely quarterly degression by 1 % in EEG 2023)
- 20 years term of contract

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

Economical feasibility and benefits are mainly defined by the renewable energy law in Germany

Feed-in

- Feed-in tariff of 6.2 – 13.4 cent/kWh if all power is fed into grid
- Feed-in tariff of 6.2 – 8.6 cent/kWh for partial feed-in
- (likely quarterly degression by 1 % in EEG 2023)
- 20 years term of contract

Landlord-to-tenant

- Subsidies of 2.4 – 3.8 cent/kWh available
- In case of subsidized, total power price max. 90 % of local grid tariff:
  total power price = price for direct + additional energy
- Direct consumption without grid usage can currently save ca. 10 cent/kWh of taxes and fees

Only applies to Germany!

manuel.selinsek@steinbeis-europa.de

"Energy communities organise collective and citizen-driven energy actions that help pave the way for a clean energy transition." - European commission

Societal benefits

Environmental benefits

manuel.selinsek@steinbeis-europa.de

"Energy communities organise collective and citizen-driven energy actions that help pave the way for a clean energy transition." - European commission

Societal benefits

- Contribute to creating a more local, more circular economy
- Energy independency from fossil fuels and energy imports
- Increase public acceptance of renewable energy projects and strengthen the community
- Reduce energy poverty in the area

Environmental benefits

manuel.selinsek@steinbeis-europa.de

"Energy communities organise collective and citizen-driven energy actions that help pave the way for a clean energy transition." - European commission

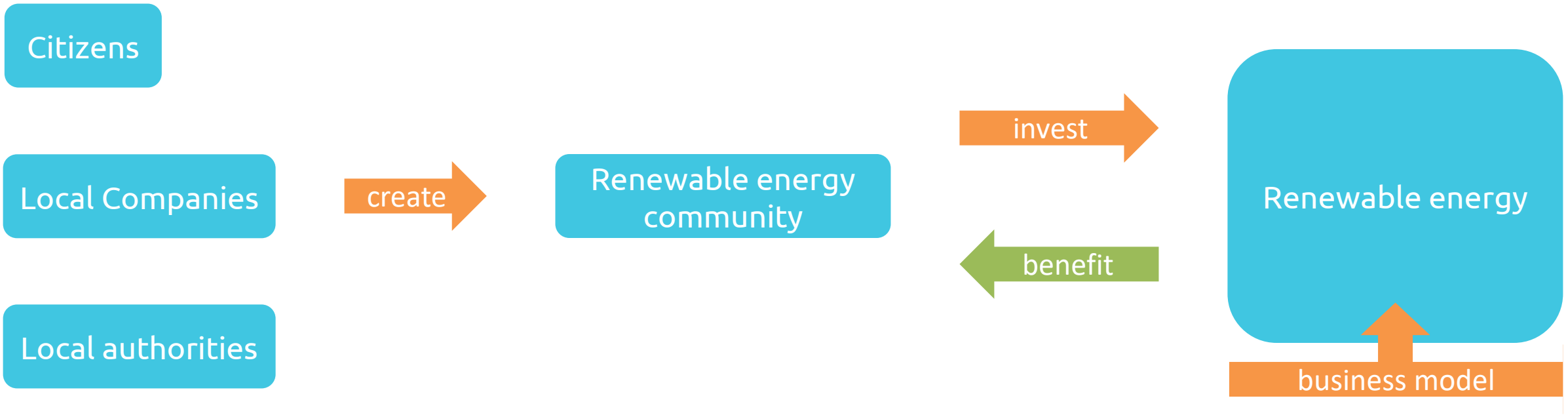
Societal benefits

- Contribute to creating a more local, more circular economy
- Energy independency from fossil fuels and energy imports
- Increase public acceptance of renewable energy projects and strengthen the community
- Reduce energy poverty in the area

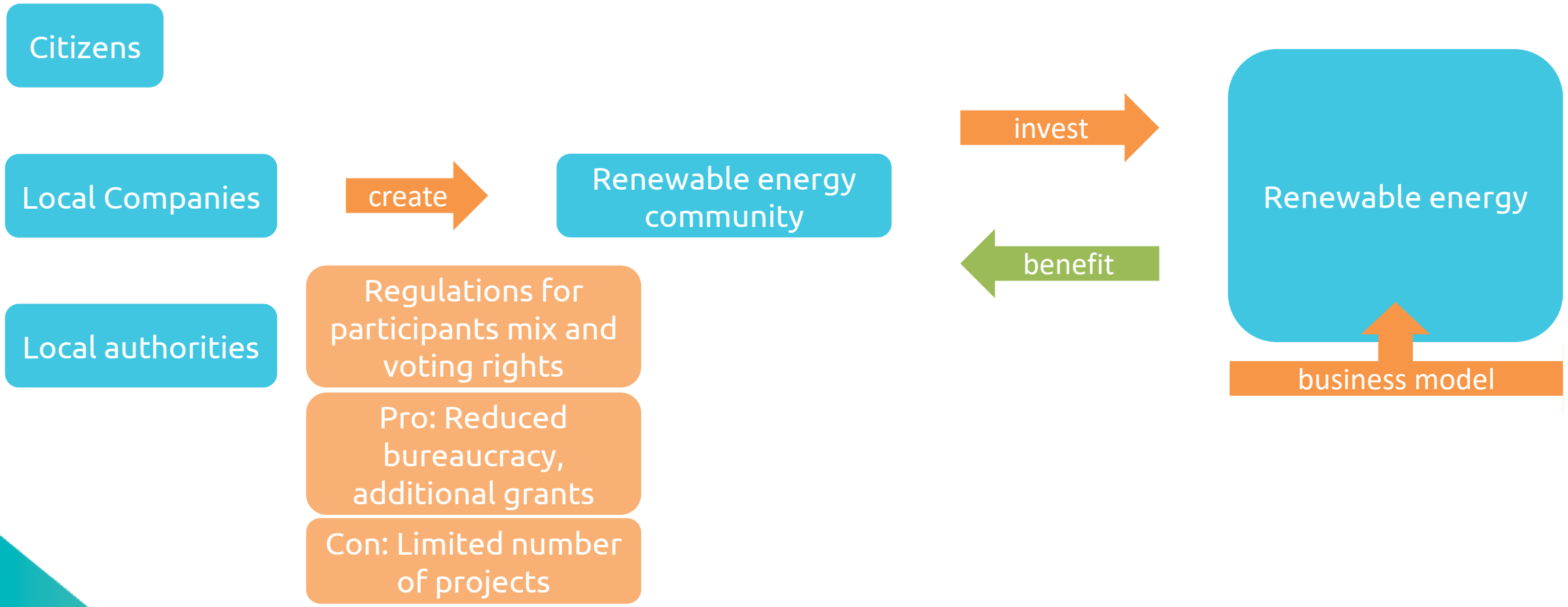
Environmental benefits

- Contribute to renewable energy transition and stop climate change
- 3 million tons of CO_2 equivalents of greenhouse gases were avoided in the German electricity sector in 2020 through energy cooperatives
- Attract private investments in the clean energy transition

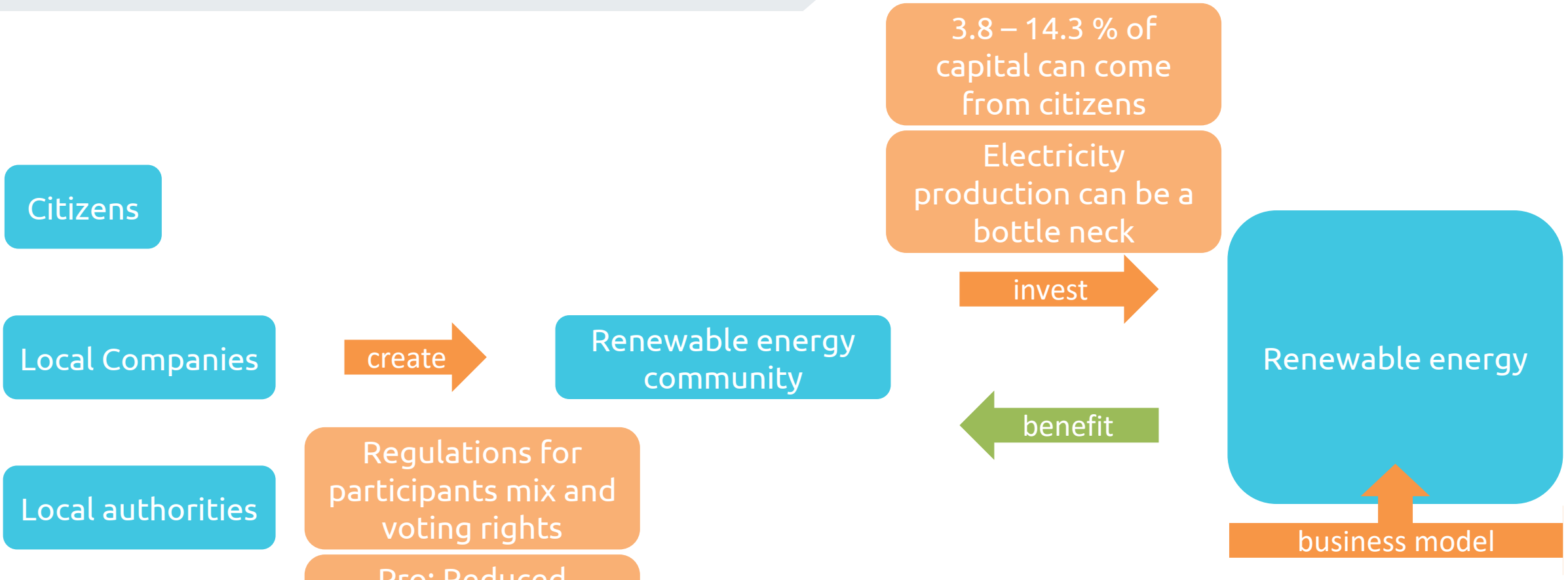
manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de



manuel.selinsek@steinbeis-europa.de

Citizens

Local Companies

Local authorities

create

Renewable energy community

Regulations for participants mix and voting rights

Pro: Reduced bureaucracy, additional grants

Con: Limited number of projects

3.8 – 14.3 % of capital can come from citizens

Electricity production can be a bottle neck

invest

benefit

Renewable energy

business model

2 main business models: Feed-in and landlord-tenant

Landlord-tenant very attractive but complex

manuel.selinsek@steinbeis-europa.de

Citizens

Local Companies

Local authorities

create

Renewable energy community

Regulations for participants mix and voting rights

Pro: Reduced bureaucracy, additional grants

Con: Limited number of projects

3.8 – 14.3 % of capital can come from citizens

Electricity production can be a bottle neck

invest

benefit

Plenty social and environmental benefits

Economical feasibility defined by renewable energy law

Renewable energy

business model

2 main business models: Feed-in and landlord-tenant

Landlord-tenant very attractive but complex

manuel.selinsek@steinbeis-europa.de

Thank you for your attention!

islander

ACCELERATING THE DECARBONIZATION OF ISLANDS' ENERGY SYSTEMS

islander-project.eu

info@islander-project.eu

@IslanderH2020

@ISLANDER Project

Steinbeis Europa Zentrum

Enabling Innovators to Grow

manuel.selinsek@steinbeis-europa.de

This project has received funding from the European Union's Horizon 2020 research and innovation under grant agreement No 957669

STEINBEIS EUROPA ZENTRUM
ENABLING INNOVATORS TO GROW

About Us

- Located in SW Germany
- **90** employees
- **30** years of experience
- **500** clients consultations a year
- **600** international partners
- **70** EU projects a year

Our Topics

- Climate, Energy & Mobility
- Digitalisation & Industry 4.0
- Food & Natural Resources
- Health
- Transformation of the Society
- Culture, Creativity & Inclusive Society

Our Customers

- **60 %** Enterprises & Start-ups
- **23 %** Universities and Research Institutes
- **9 %** Policy and Public Stakeholders
- **5 %** Clusters and Networks
- **3 %** Others

Our Services

- Innovation Management
- EU Funding
- International Markets
- Regional and Social Transformation
- Innovation Policy
- Events and Trainings

Steinbeis Europa Zentrum

Icons source: Icons8.com