

# Renewable energy in Styria

---

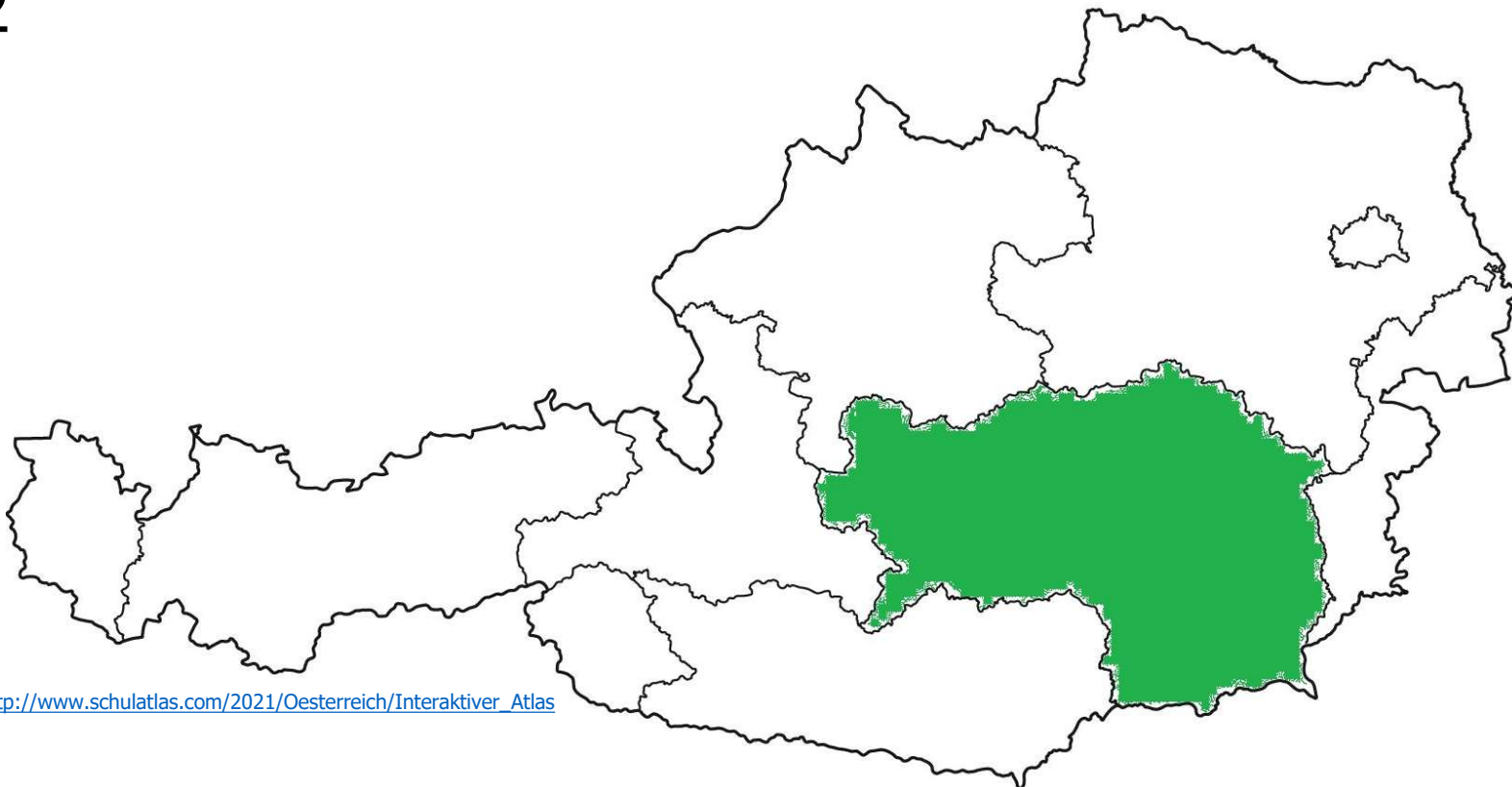
**EURORAI 2024 Graz, Austria**

Patrick Dzuban

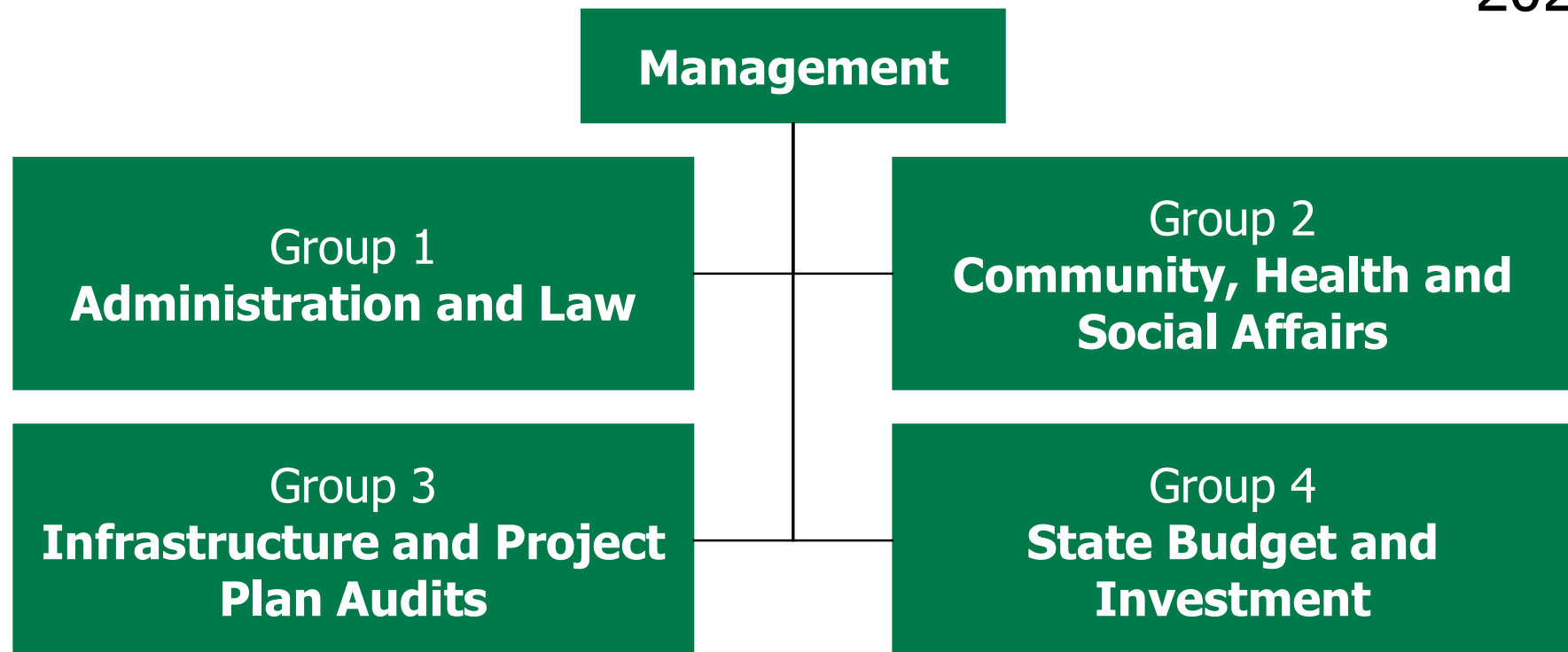
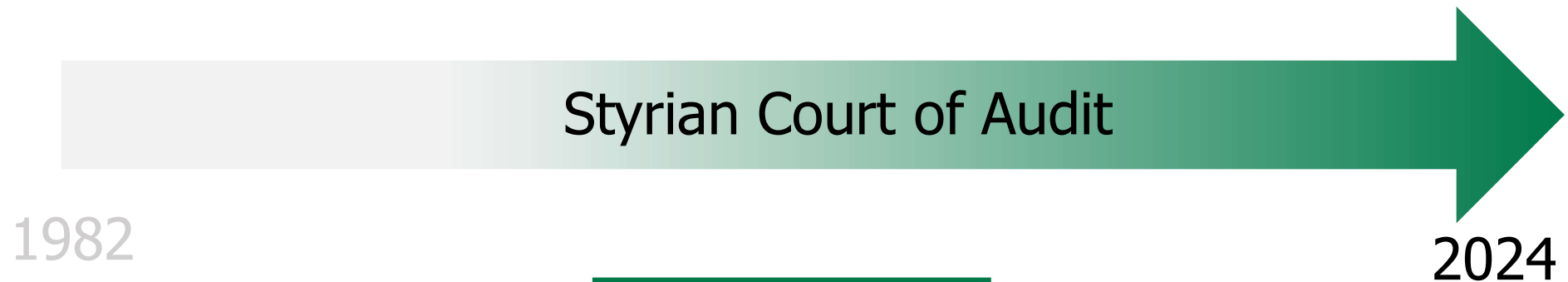
## Styrian Court of Audit

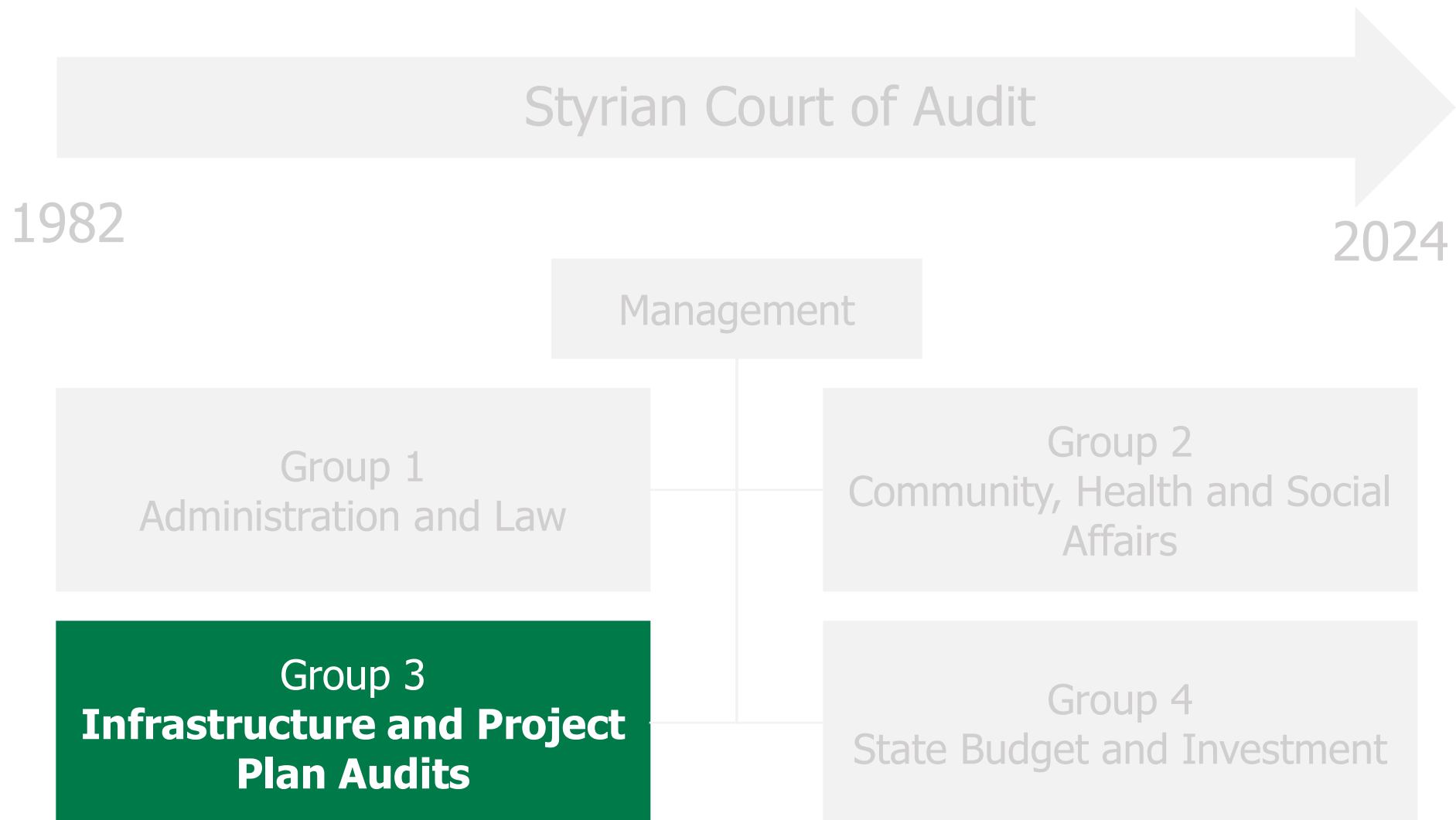
1982

2024



[http://www.schulatlas.com/2021/Oesterreich/Interaktiver\\_Atlas](http://www.schulatlas.com/2021/Oesterreich/Interaktiver_Atlas)





## Infrastructure and Project Plan Audits



## Infrastructure and Project Plan Audits

**Audits**

ex post



## Infrastructure and Project Plan Audits

### Project Plan Audits

ex ante

Audits

ex post

## Infrastructure and Project Plan Audits

### Project Plan Audits

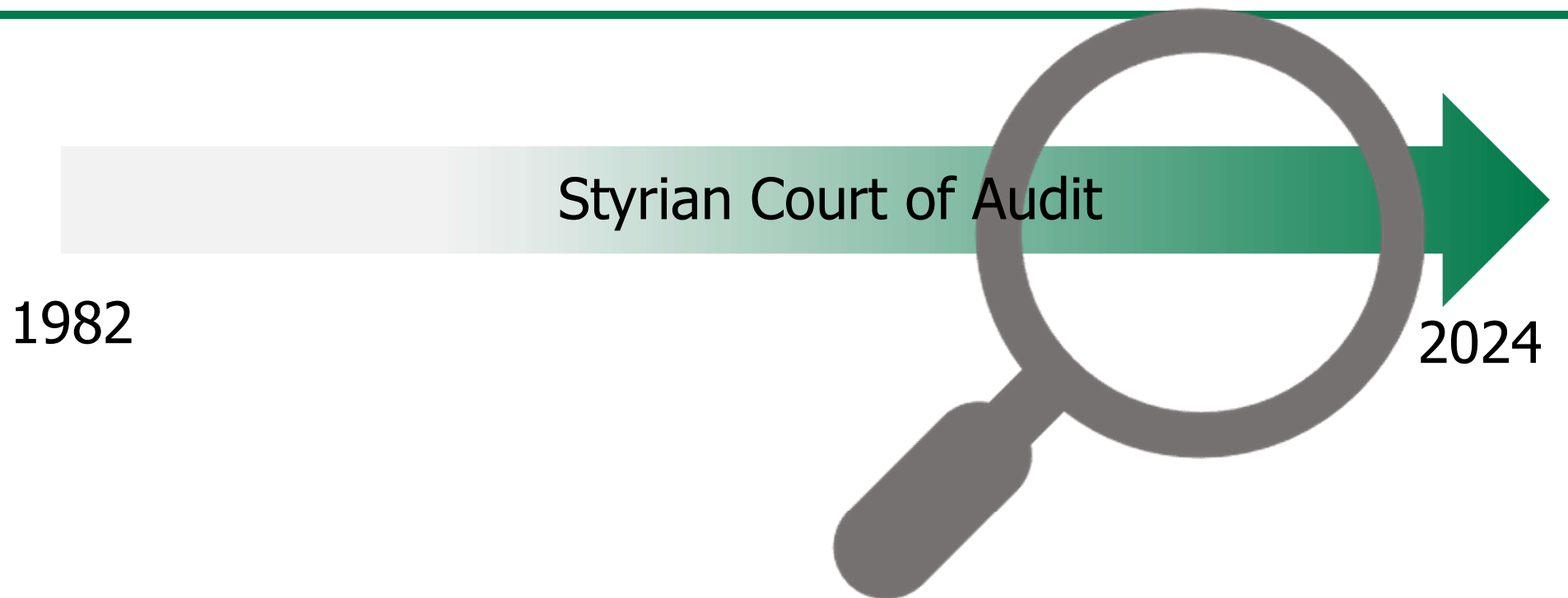
ex ante

- Projects > 0.2 % of the state budget
- Demand, investment costs and **follow-up costs** (energy!)

Audits

ex post





**Findings from** the period **2015 to 2022**  
in the **energy** sector

# Experience of renewable energy

---





2015 2016 2017 2018 2019 2020 2021 2022

**7 project plan audits**

**3 energy management audits**

**1 renewable energy audit**



**7 project plan audits**

3 energy management audits

1 renewable energy audit

---

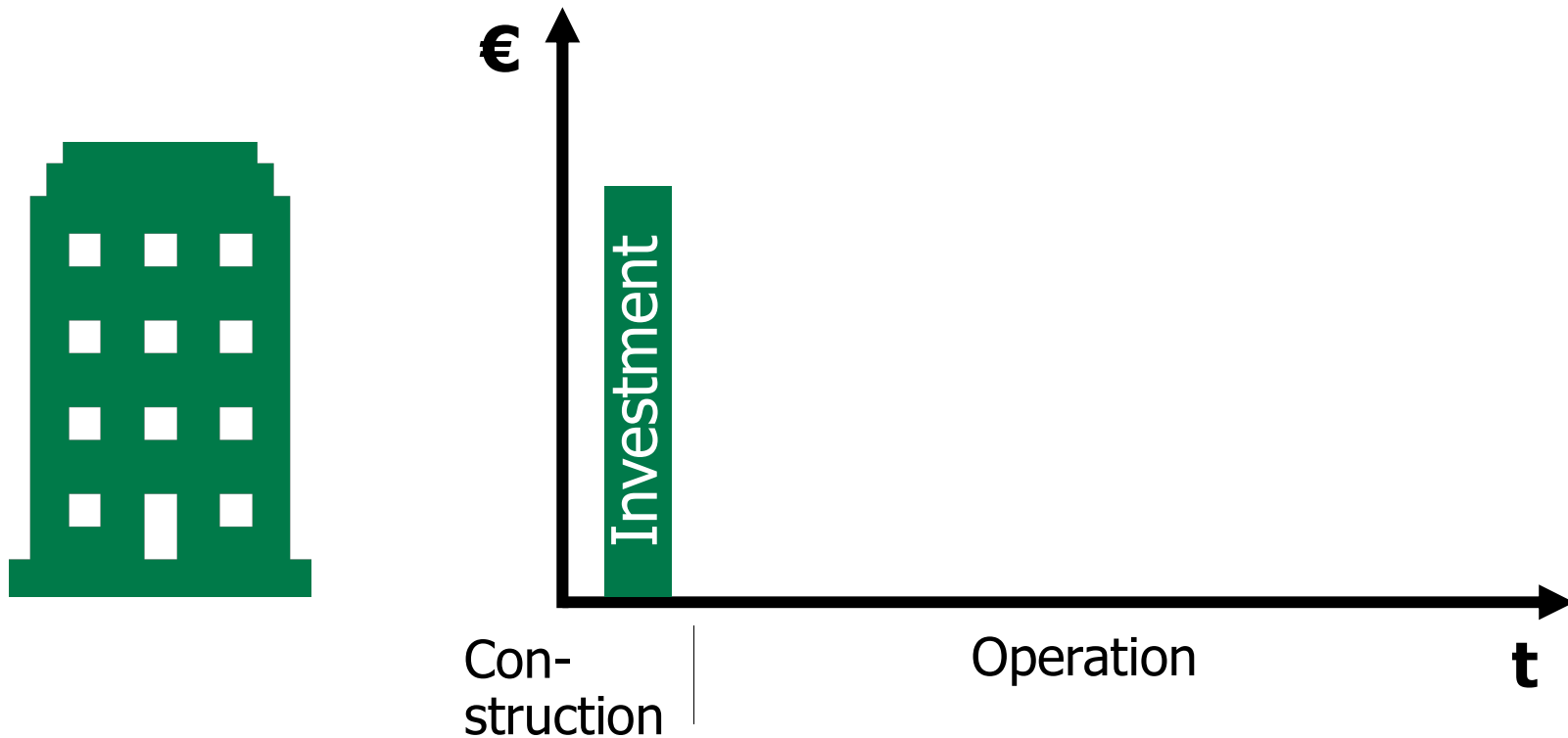
Superficial consideration of follow-up costs

>> focus on investment

# Observation 1

Superficial consideration of follow-up costs

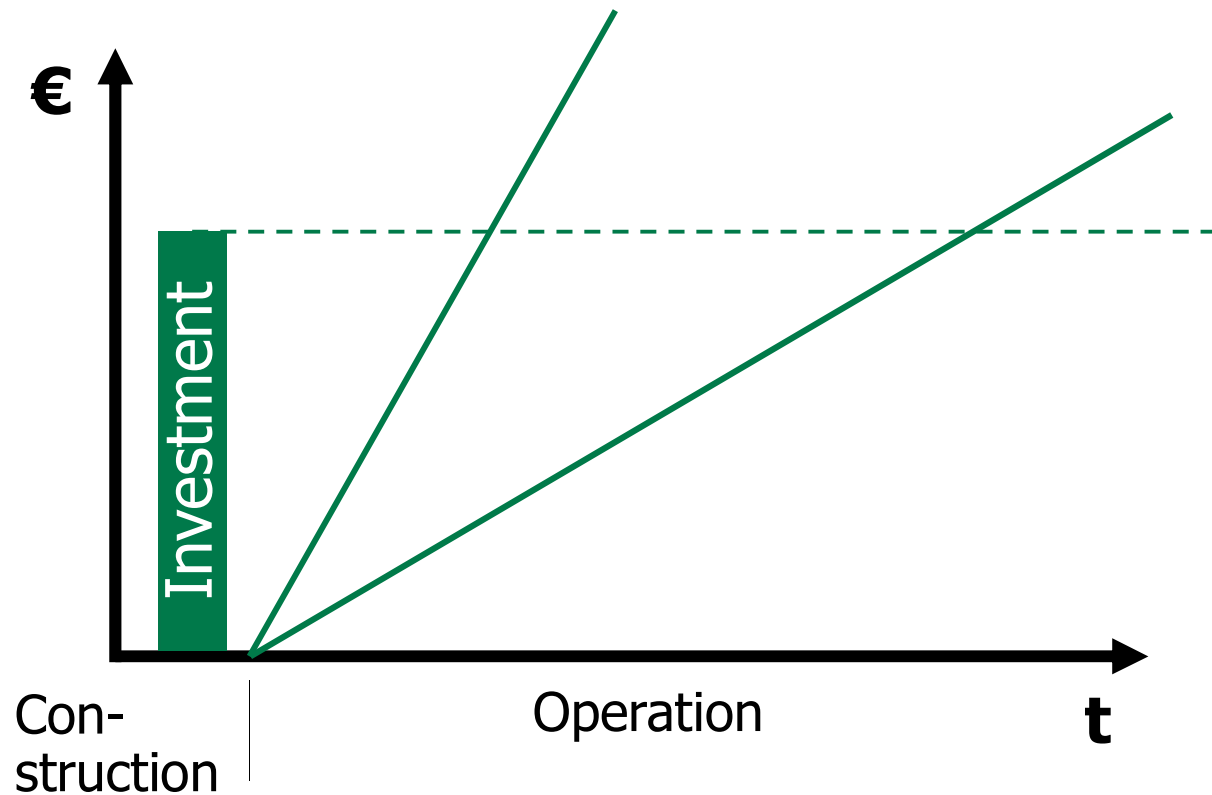
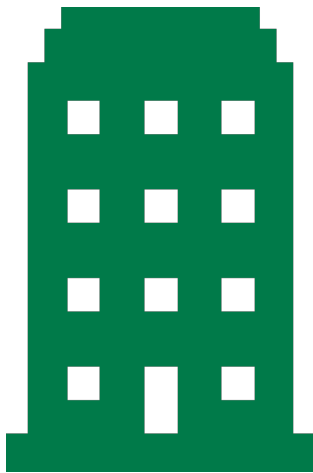
>> focus on investment



# Observation 1

Superficial consideration of follow-up costs

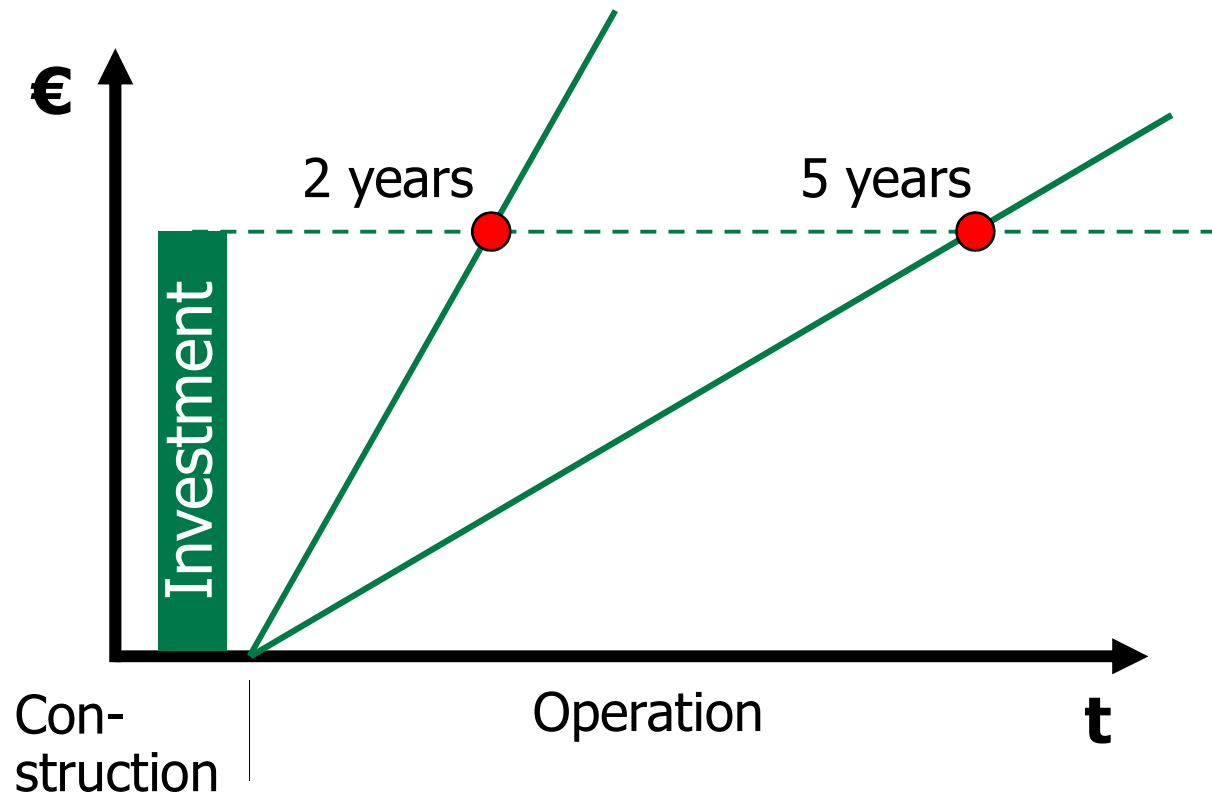
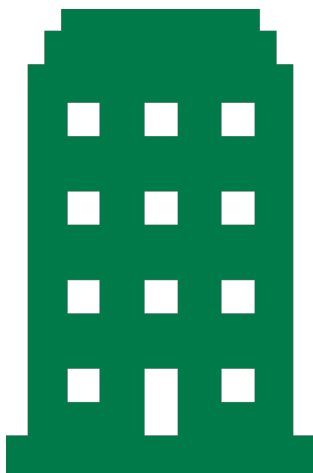
>> focus on investment



# Observation 1

Superficial consideration of follow-up costs

>> focus on investment





# Holistic life cycle considerations

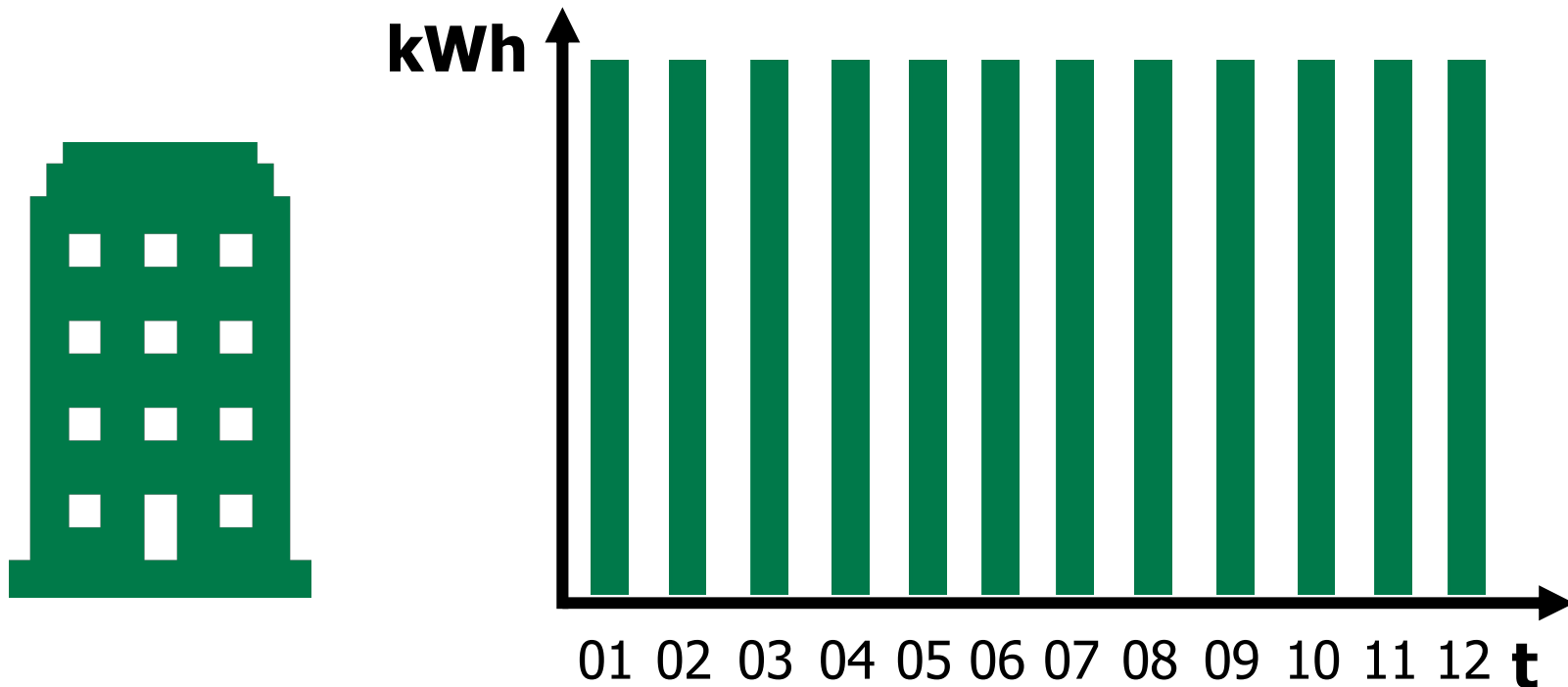
No photovoltaic plant

>> despite high power consumption

## Observation 2

No photovoltaic plant

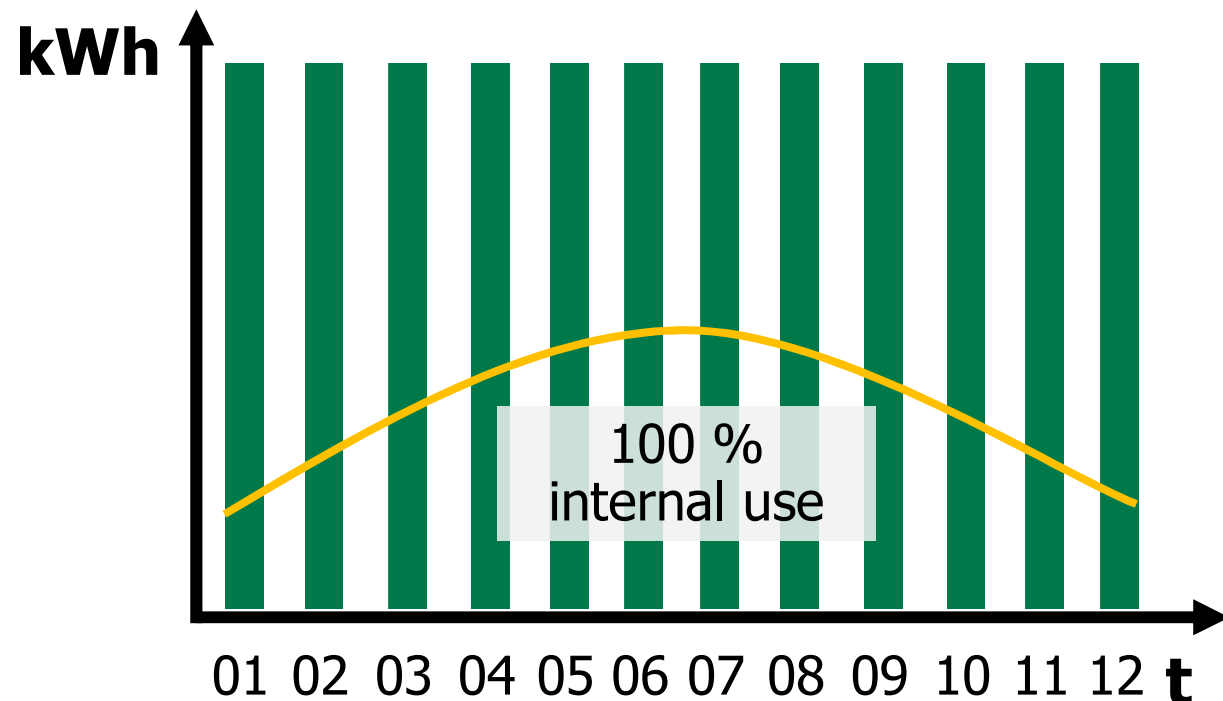
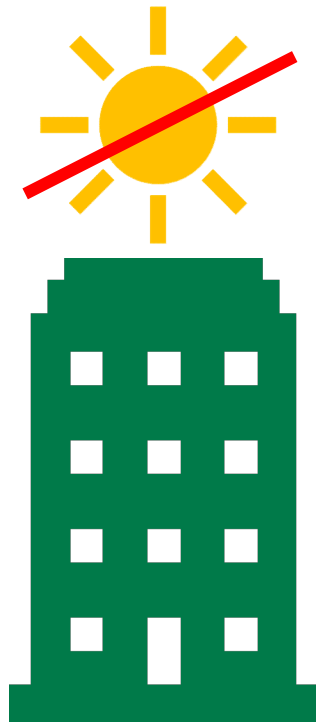
>> despite high power consumption



## Observation 2

No photovoltaic plant

>> despite high power consumption



# **Incorporate alternative energy generation systems**

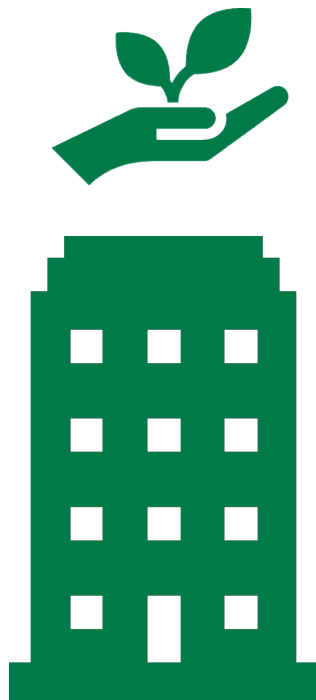
---

Insufficient monitoring

>> despite defined sustainability targets

## Insufficient monitoring

>> despite defined sustainability targets



Target: relevant certification



Competition

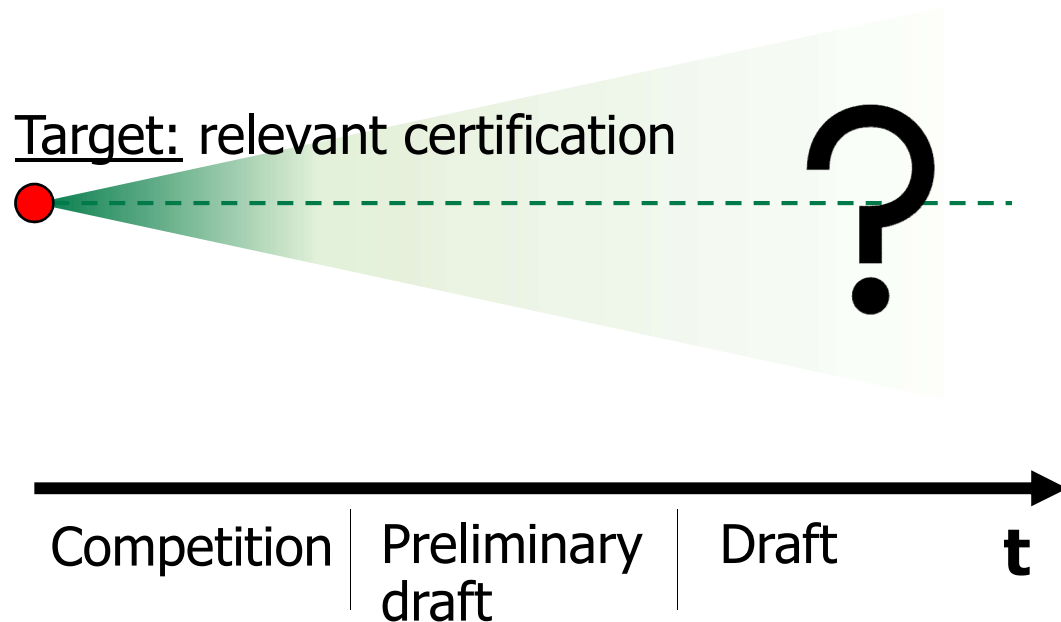
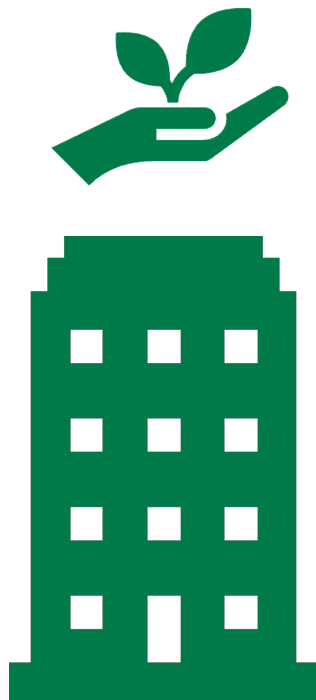
Preliminary  
draft

Draft

**t**

## Insufficient monitoring

>> despite defined sustainability targets





**Regularly monitor planned targets  
during each stage of the project**



2015 2016 2017 2018 2019 2020 2021 2022

7 project plan audits

**3 energy management audits**

1 renewable energy audit

## Usage data

>> Missing or incorrect energy values

## Usage data

>> Missing or incorrect energy values

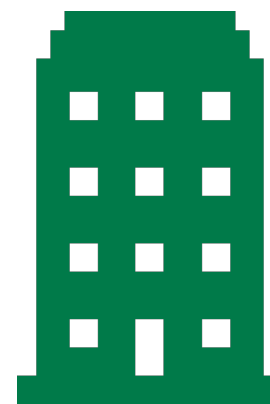
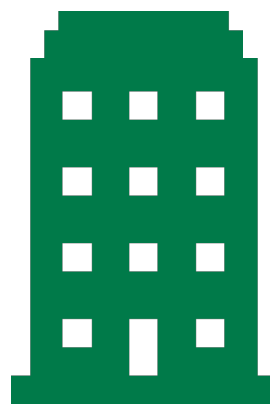
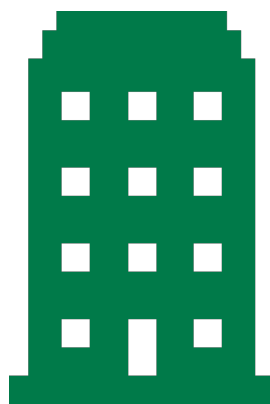
Power  
consumption  
in:

2016

2017

2018

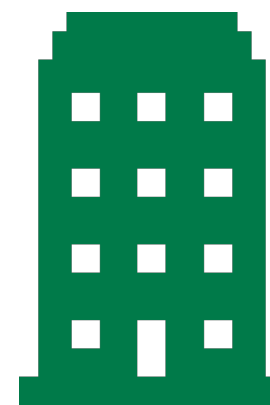
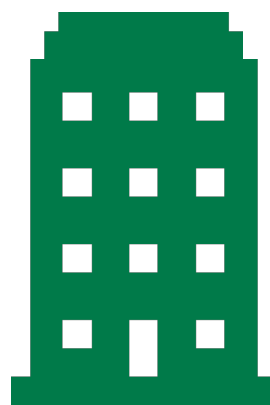
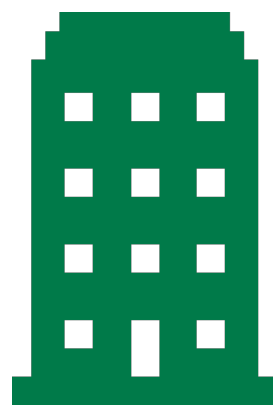
Total



## Usage data

>> Missing or incorrect energy values

Power  
consumption  
in:

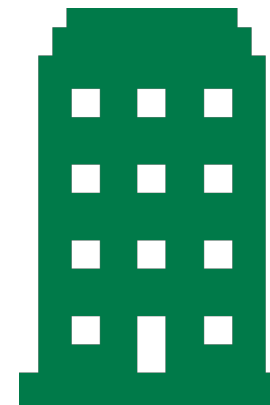
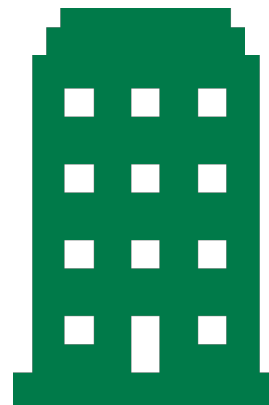
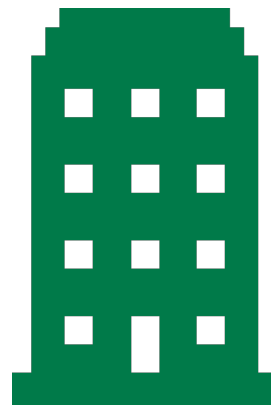


2016	5,000 kWh	30 kWh	2,000 kWh
2017	?	3,200 kWh	2,200 kWh
2018	4,800 kWh	3,100 kWh	1,800 kWh
Total	9,800 kWh	6,330 kWh	9,000 kWh

## Usage data

>> Missing or incorrect energy values

Power  
consumption  
in:



2016	5,000 kWh	30 kWh	2,000 kWh
2017	?	3,200 kWh	2,200 kWh
2018	4,800 kWh	3,100 kWh	1,800 kWh
Total	9,800 kWh	6,330 kWh	9,000 kWh

# Quality-assured data management

Measure effectiveness

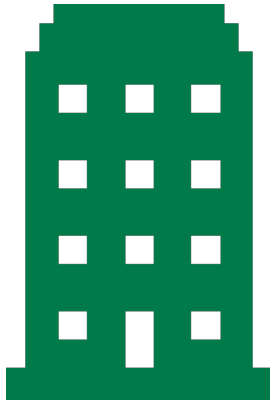
>> No prior/subsequent consideration



Measure effectiveness

>> No prior/subsequent consideration

Existing building

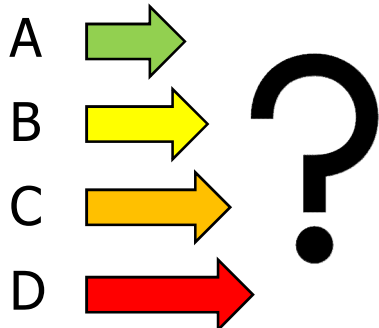
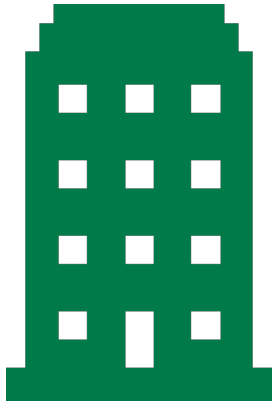


# Observation 5

Measure effectiveness

>> No prior/subsequent consideration

Existing building

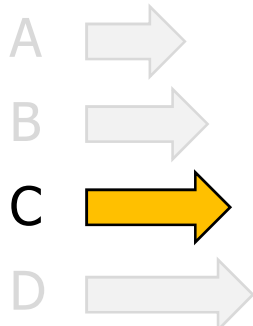
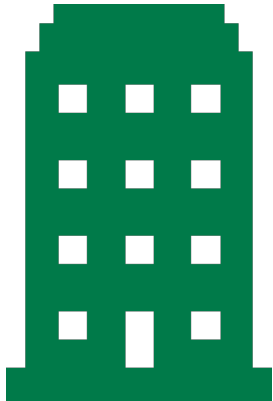


# Observation 5

Measure effectiveness

>> No prior/subsequent consideration

Existing building

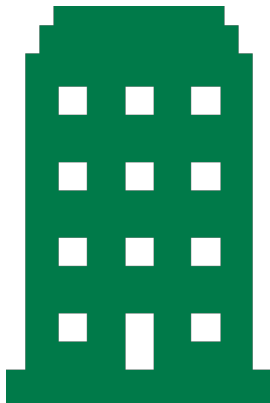


# Observation 5

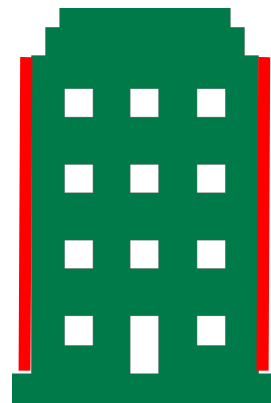
## Measure effectiveness

>> No prior/subsequent consideration

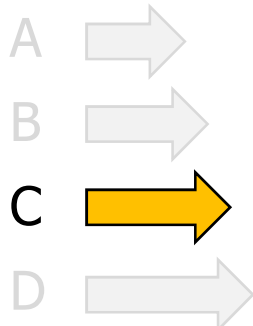
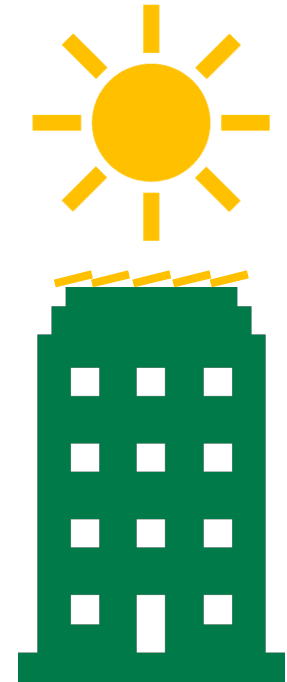
Existing building



Measure 1



Measure 2

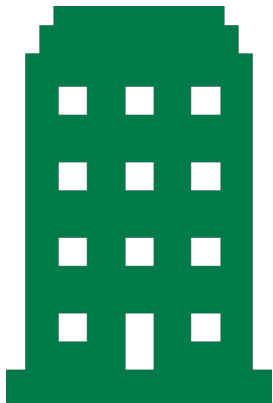


# Observation 5

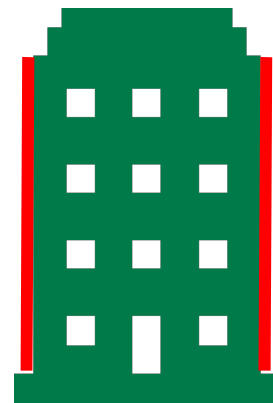
## Measure effectiveness

>> No prior/subsequent consideration

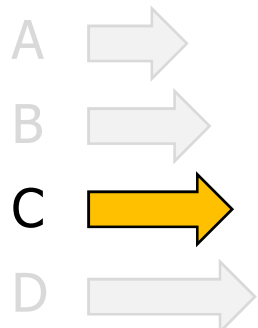
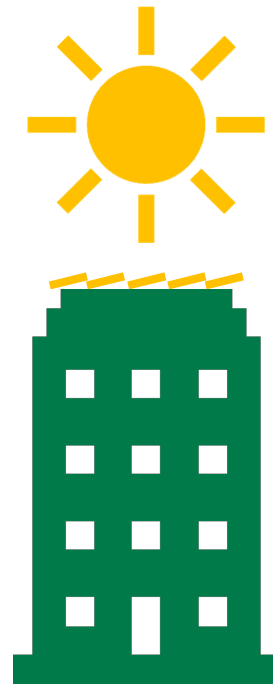
Existing building



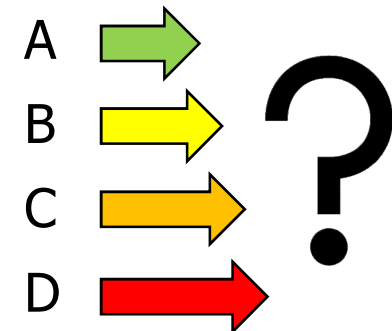
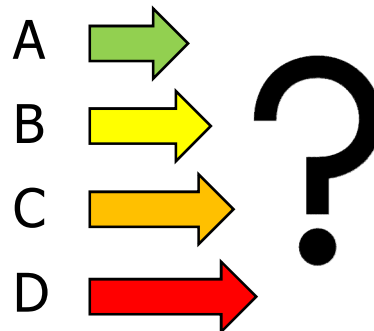
Measure 1



Measure 2



Renewable energy in Styria



Patrick Dzuban

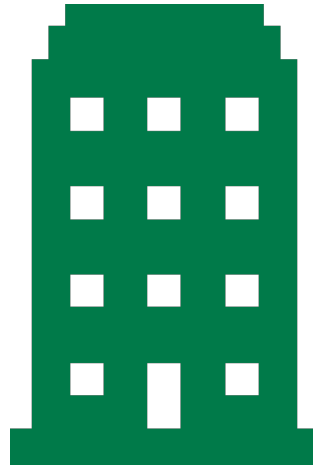
**Record the energy-saving qualities  
of buildings prior to and following  
the implementation of measures**

Lack of clear responsibility

>> Many participants without defined interfaces

Lack of clear responsibility

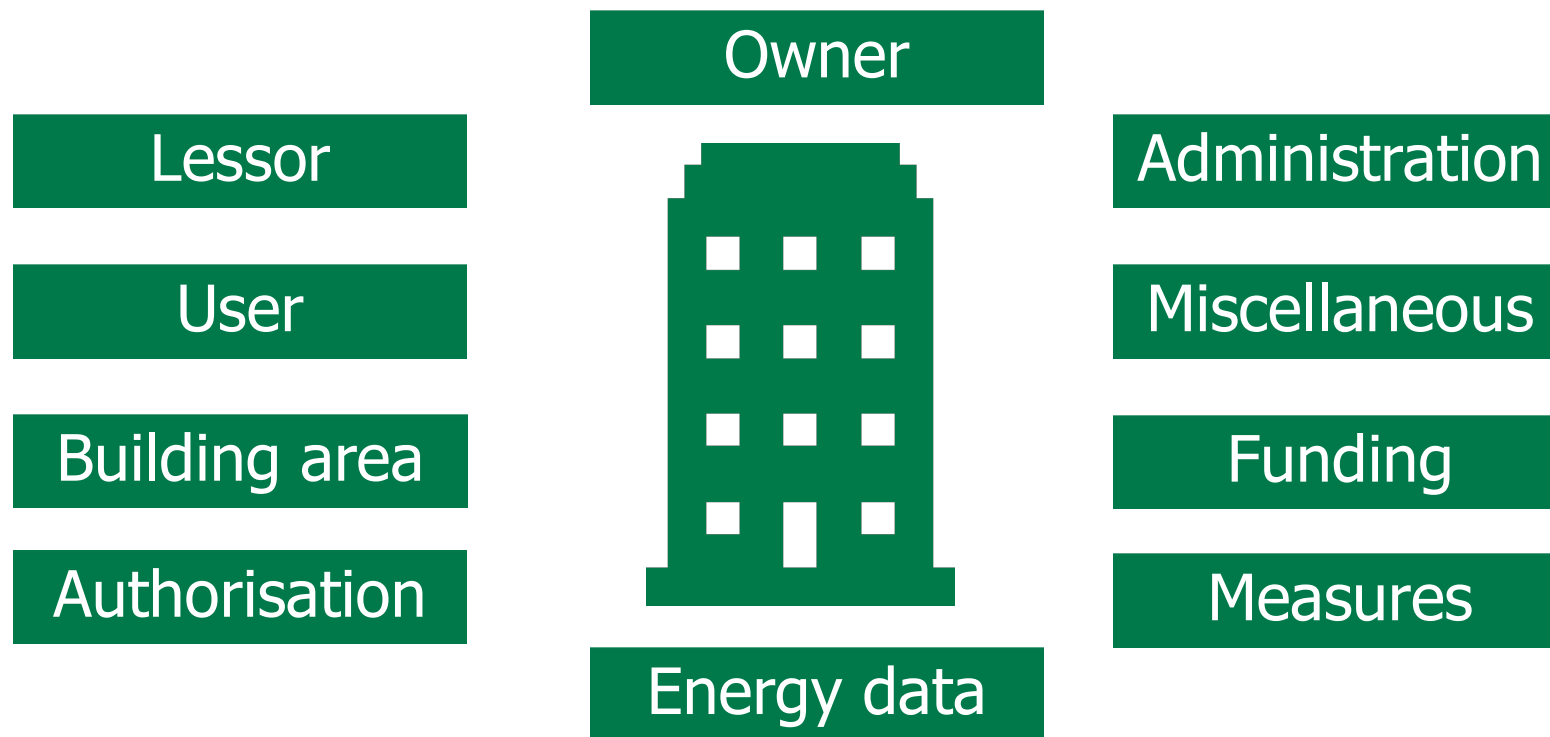
>> Many participants without defined interfaces





Lack of clear responsibility

>> Many participants without defined interfaces



Lack of clear responsibility

>> Many participants without defined interfaces



**Assign clear responsibility and  
collect and evaluate relevant data  
centrally**



7 project plan audits

3 energy management audits

**1 renewable energy audit**

Share of renewable energy

>> setting various targets

## Share of renewable energy

>> setting various targets

	Austria	Styria
Gross final energy requirement (2030)		
Power consumption (2030)		
Climate neutrality		

## Share of renewable energy

>> setting various targets

	Austria	Styria
Gross final energy requirement (2030)	46-50 %	40 %
Power consumption (2030)	100 %	Not specified
Climate neutrality	by 2040	by 2050

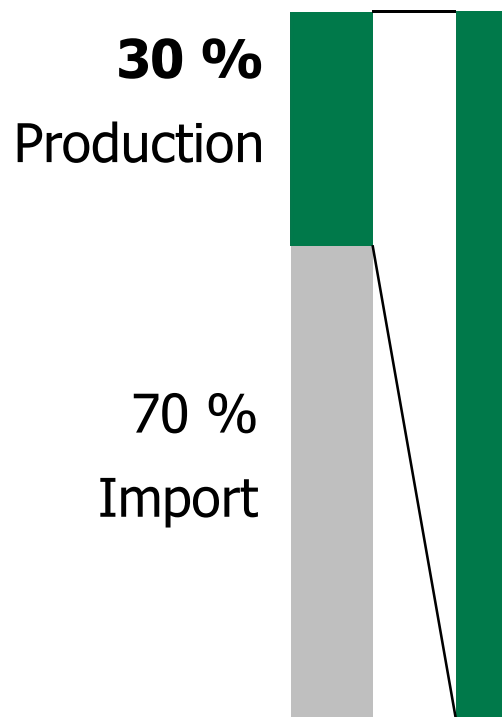
**Strategies and measures are based on various targets!**

**Set clear and consistent targets and  
measures derived from these**



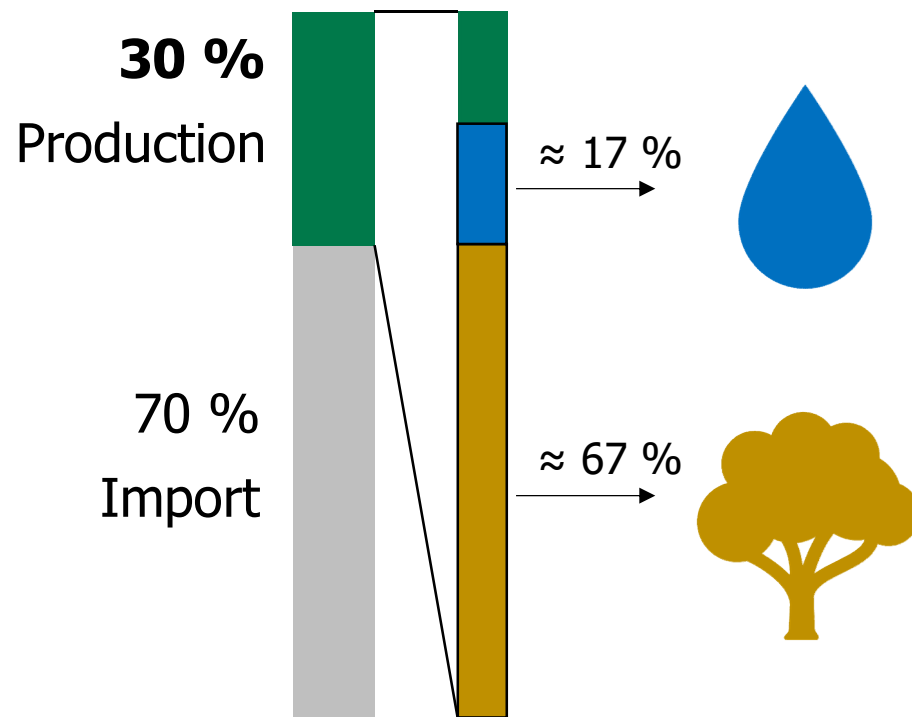
## 2. Renewable energy source

>> Exploiting potential



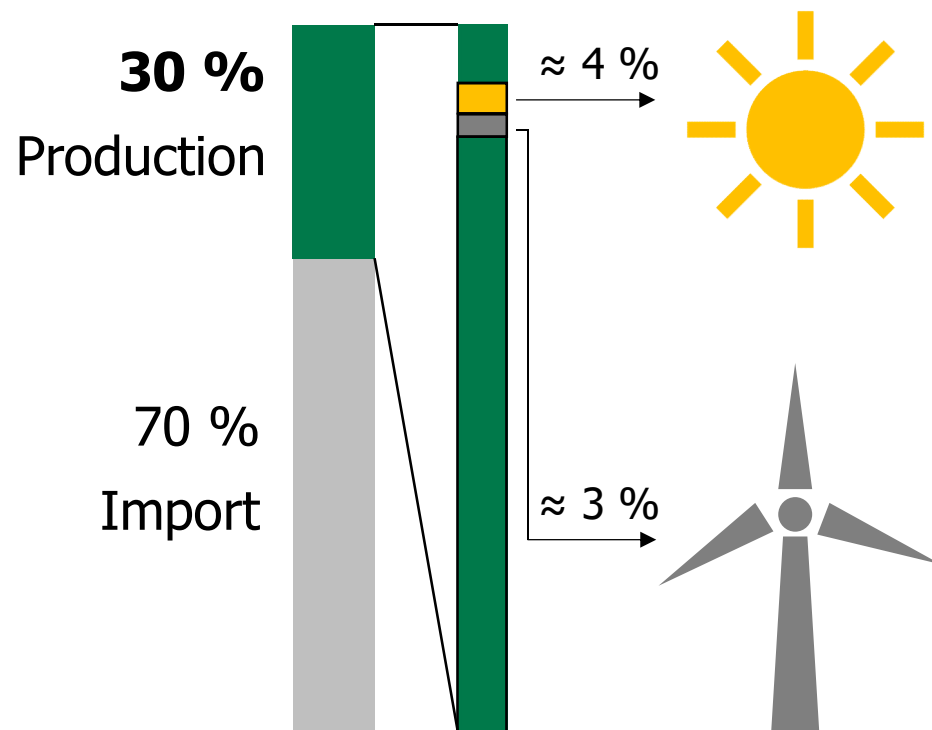
## 2. Renewable energy source

>> Exploiting potential - high



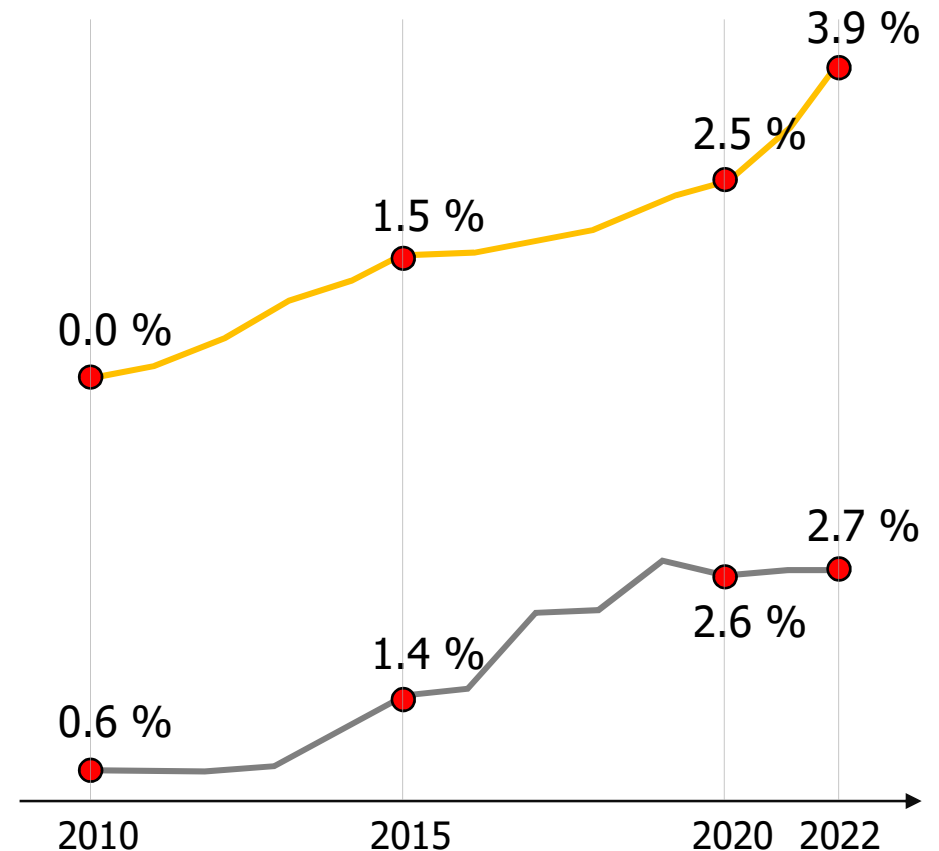
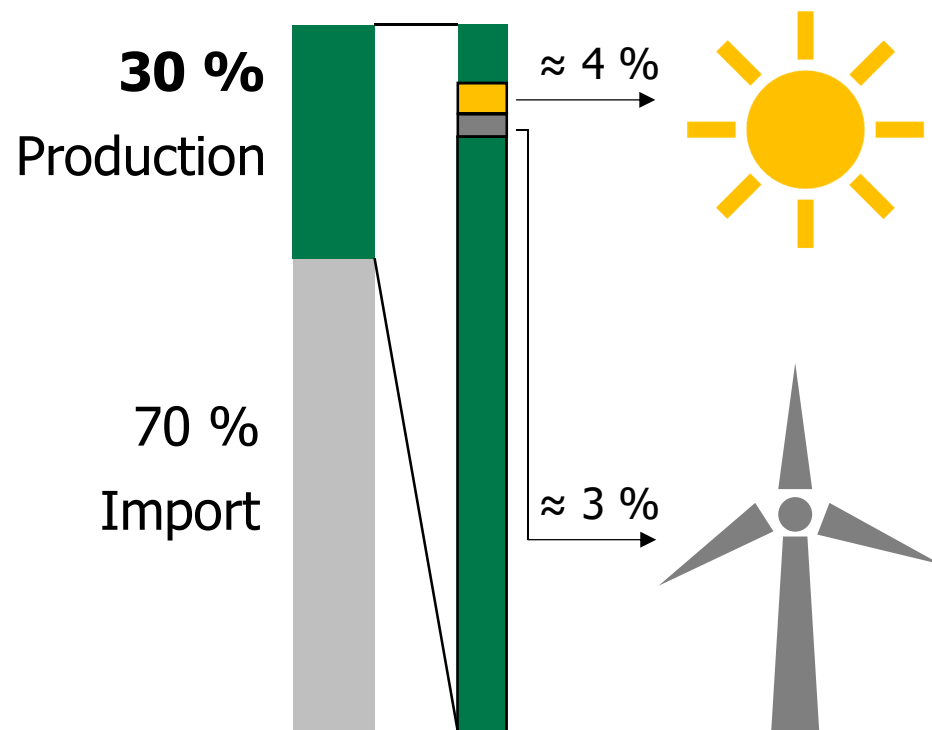
## 2. Renewable energy source

>> Exploiting potential - low



## 2. Renewable energy source

>> Exploiting potential - low

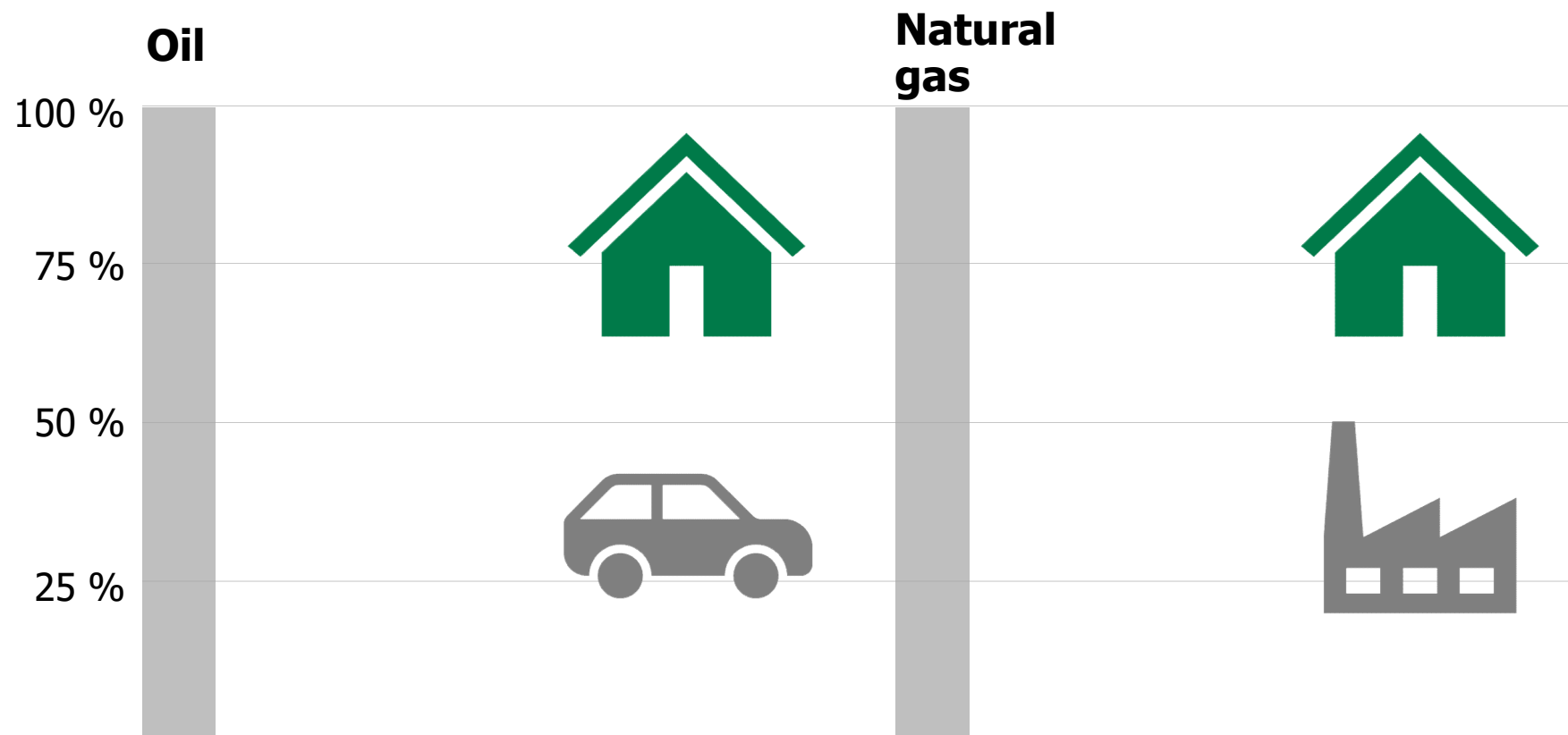


**Implement swift action to exploit  
potentials quickly**

# Observation 9

Considerable energy consumption

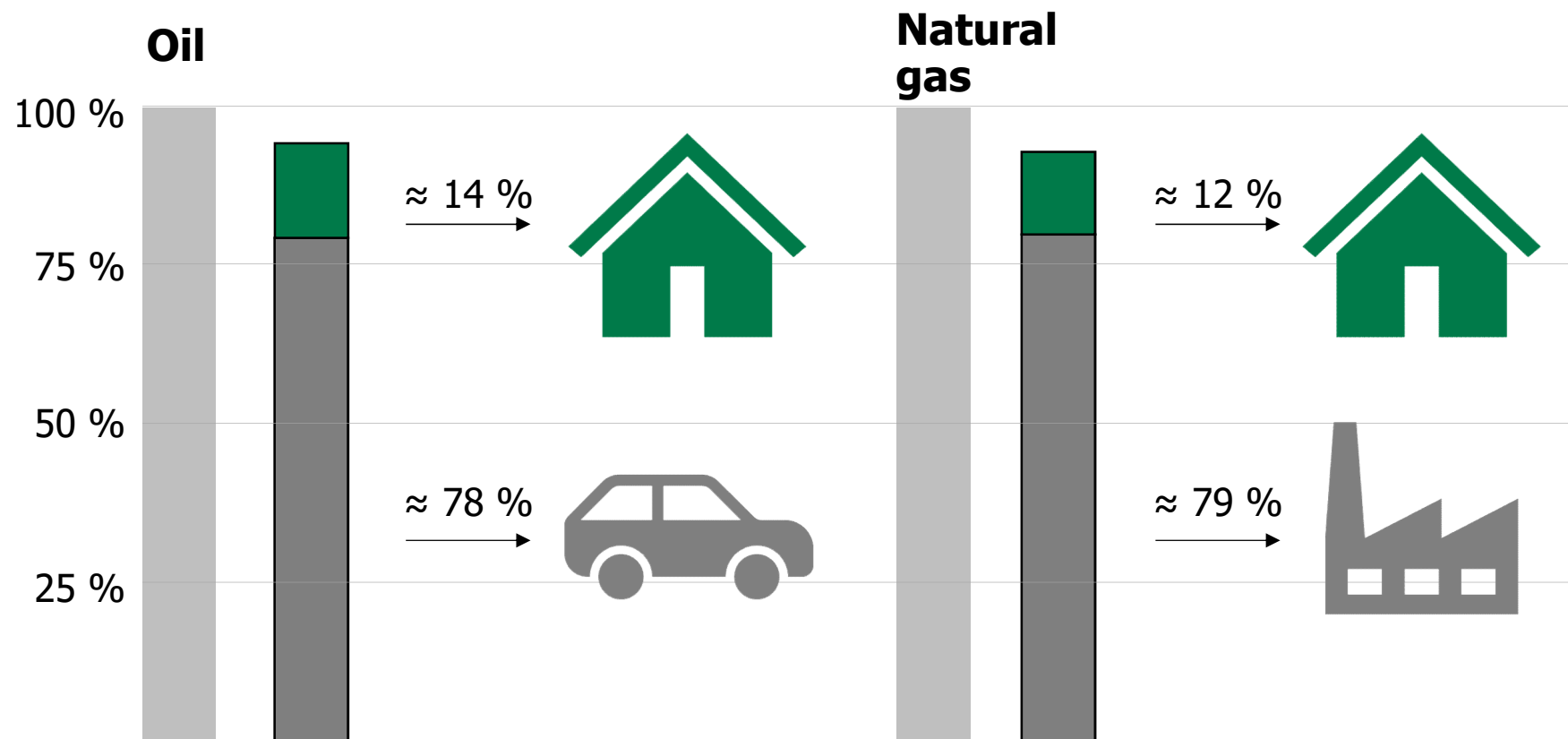
>> Leveraging measures



# Observation 9

Considerable energy consumption

>> Leveraging measures



# **Increase support in the industry and transport sector**



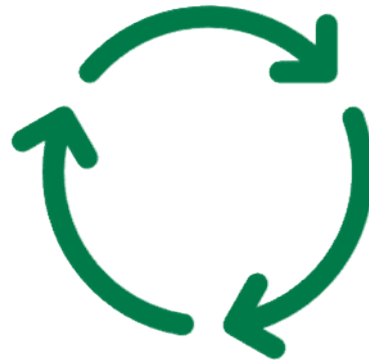
1. Life cycle considerations
2. Alternative energy generation systems
3. Monitoring targets
4. Data management
5. Measure effectiveness
6. Responsibilities
7. Setting targets
8. Exploiting potential
9. Leveraging measures

## What contribution could Audit Institutions make?

## **Scrutinise existing data** (total and project-related)



## **Support** for iterative **improvement** **processes**



## **Demonstrate effective development potential**



## Audits:

- Renewable energy in Styria:  
<https://www.landesrechnungshof.steiermark.at/cms/beitrag/12914508/174678476/>
- Energy management in buildings which are subject to the KAGes (Styrian public hospital association):  
<https://www.landesrechnungshof.steiermark.at/cms/beitrag/12912642/174678476/>
- Energy management in official buildings:  
<https://www.landesrechnungshof.steiermark.at/cms/beitrag/12912641/174678476/>
- Facility management in Styria's vocational schools:  
<https://www.landesrechnungshof.steiermark.at/cms/beitrag/12912628/174678476/>

## Queries:

- Patrick Dzuban  
+43 316 877 3408  
[patrick.dzuban@lrh-stmk.gv.at](mailto:patrick.dzuban@lrh-stmk.gv.at)