



**LIFE**  
CLIMATE  
PATH  
2050

Jožef Stefan Institute – Energy Efficiency Centre

# Monitoring efficiency and impact of the energy efficiency and renewable energy measures in the residential sector

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je financiran iz finančnega mehanizma LIFE, ki ga  
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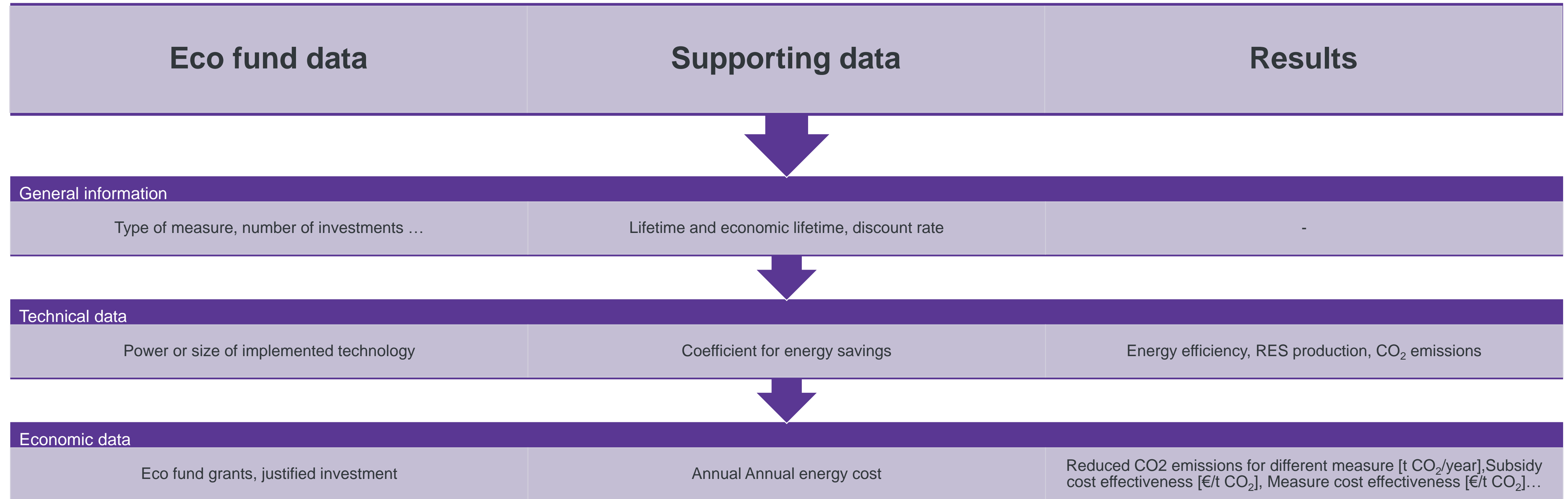
# Methodology

Base: non-refundable **Eco Fund subsidy** in 2016 for households (renewable energy source)

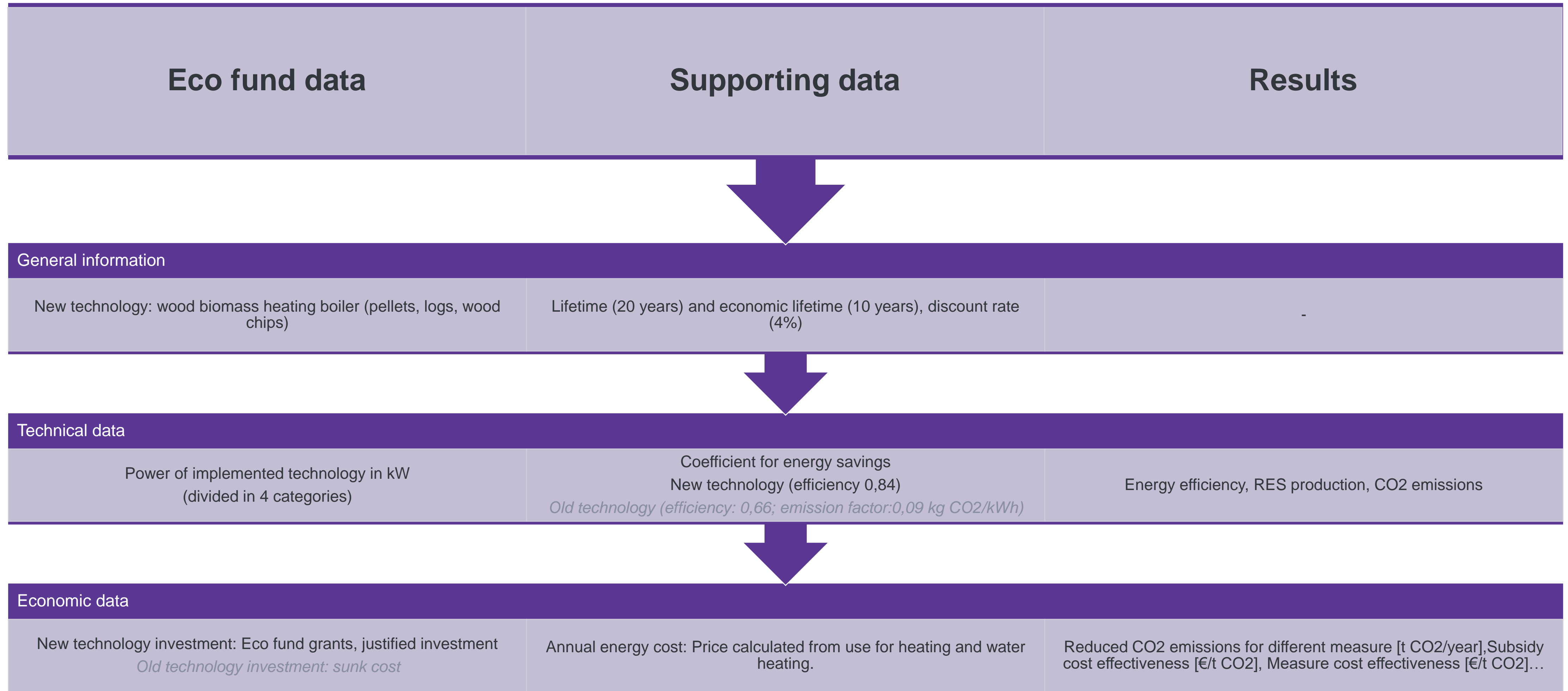
There were 854 applications for wood biomass boiler subsidies in households,

- ▶ which lead to 7.106.794 € investments in wood biomass boilers,
- ▶ that lead to reduction of 4.523 tons of CO<sub>2</sub> per year.

Our point of view: **ex-post** (old technology) and **ex-ante** (reference technology)



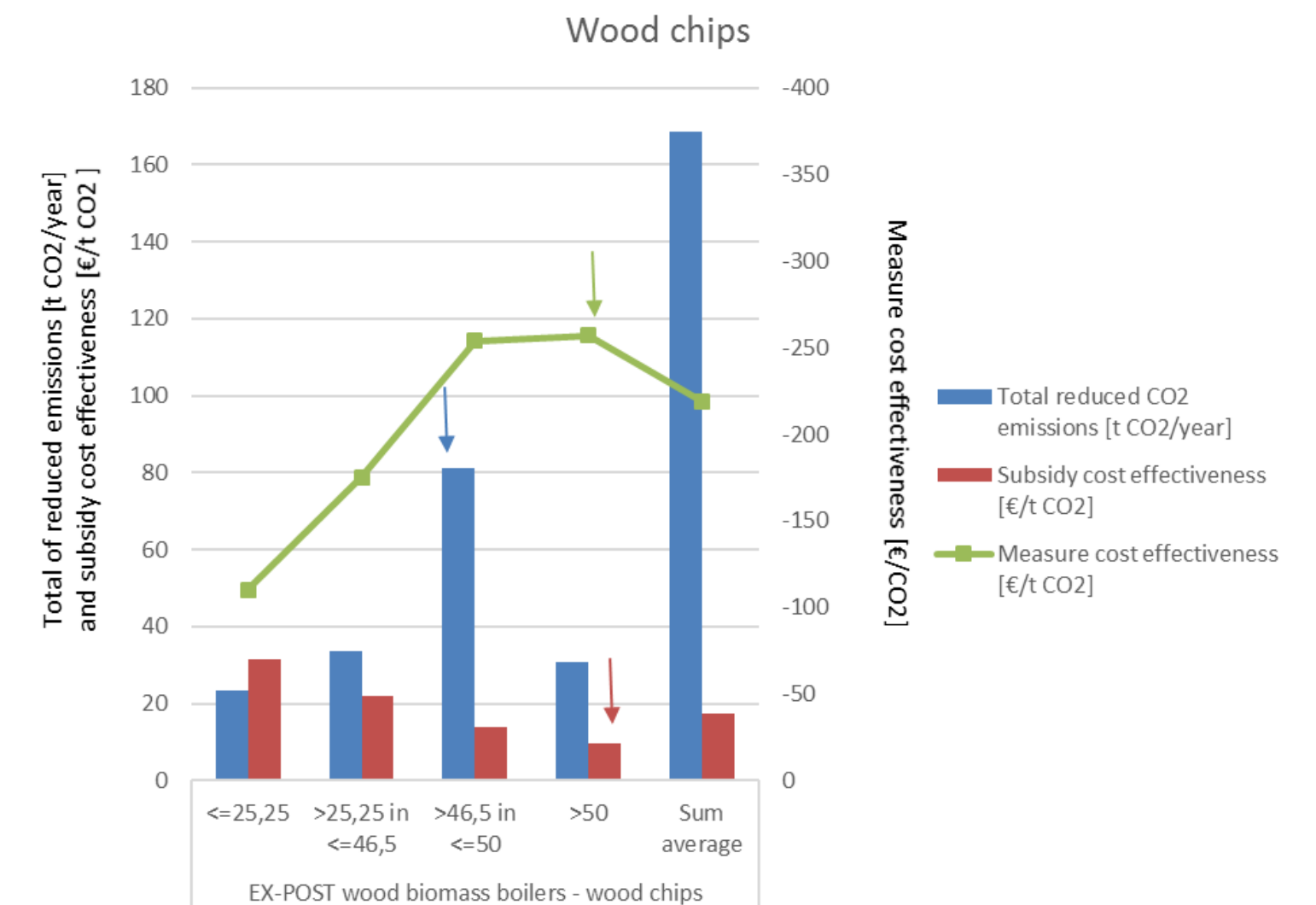
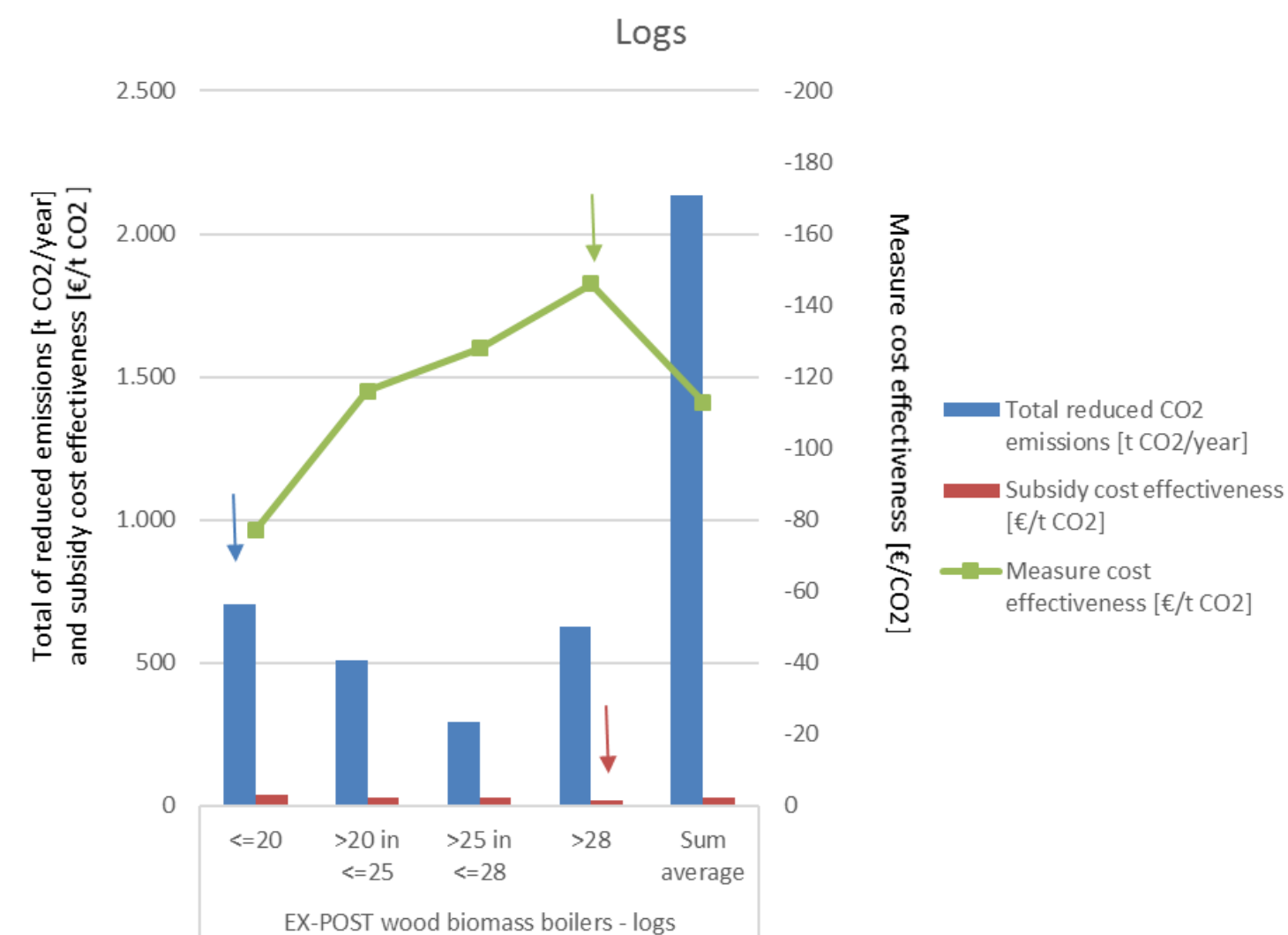
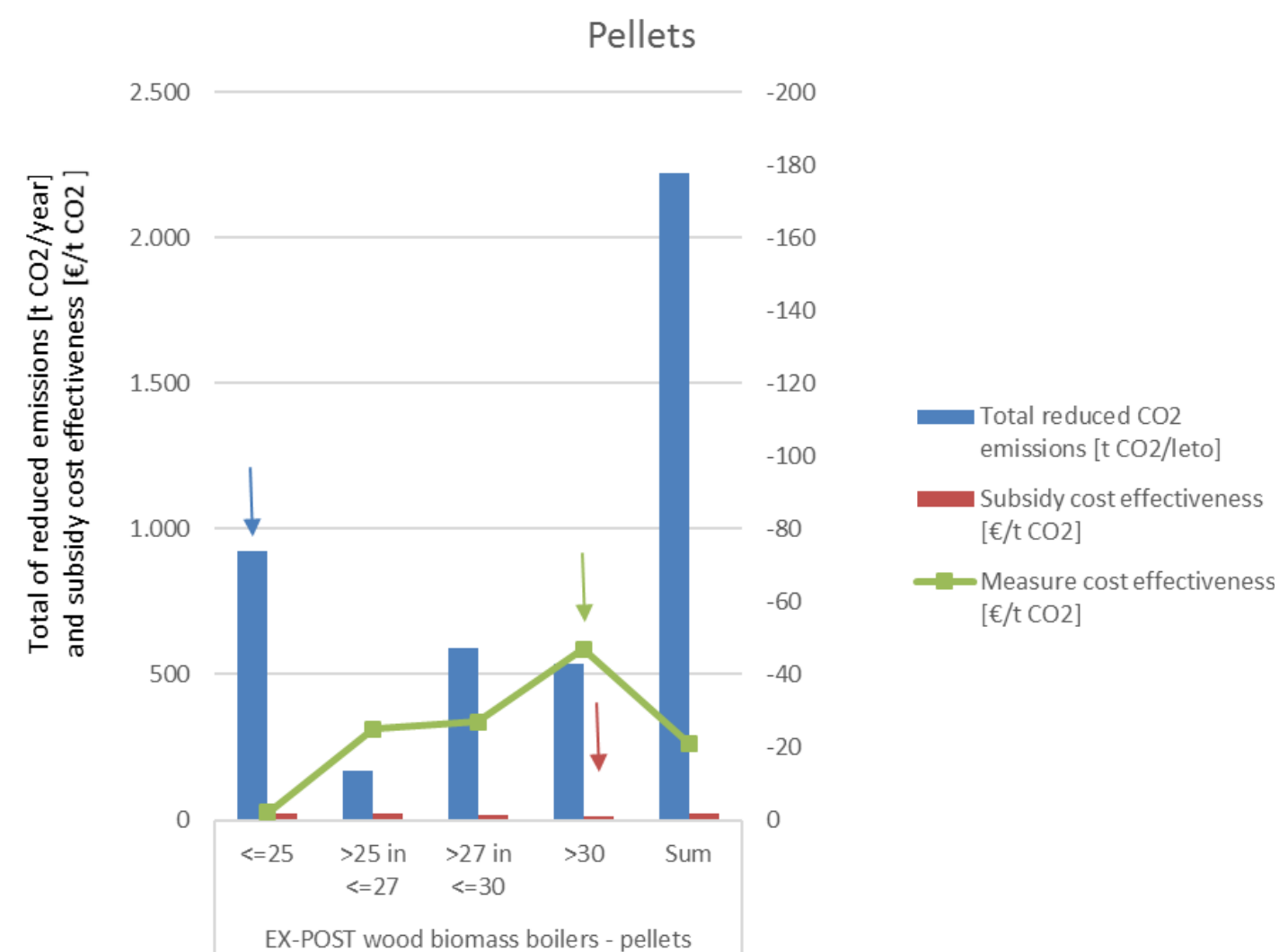
# Ex-post: new technology vs old technology



# Ex-post Results

Measure: wood biomass boiler (pellets, logs, wood chips)

- emission factor - average mix of fuels
- divided into 4 groups by power



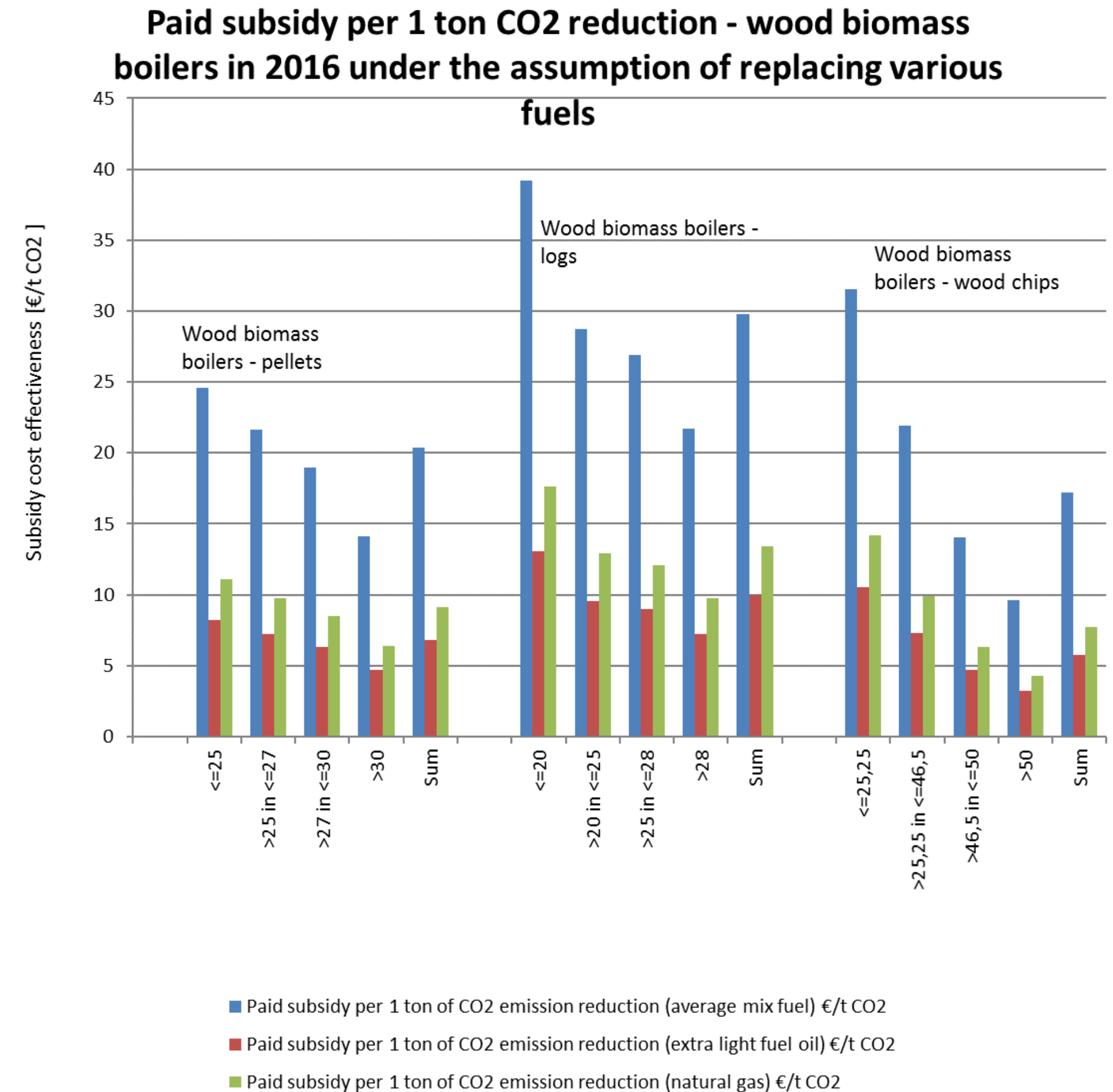
# Ex-post

## What happens if we change energy source?

Indicator - subsidy paid per 1 ton of CO<sub>2</sub> emission reduction

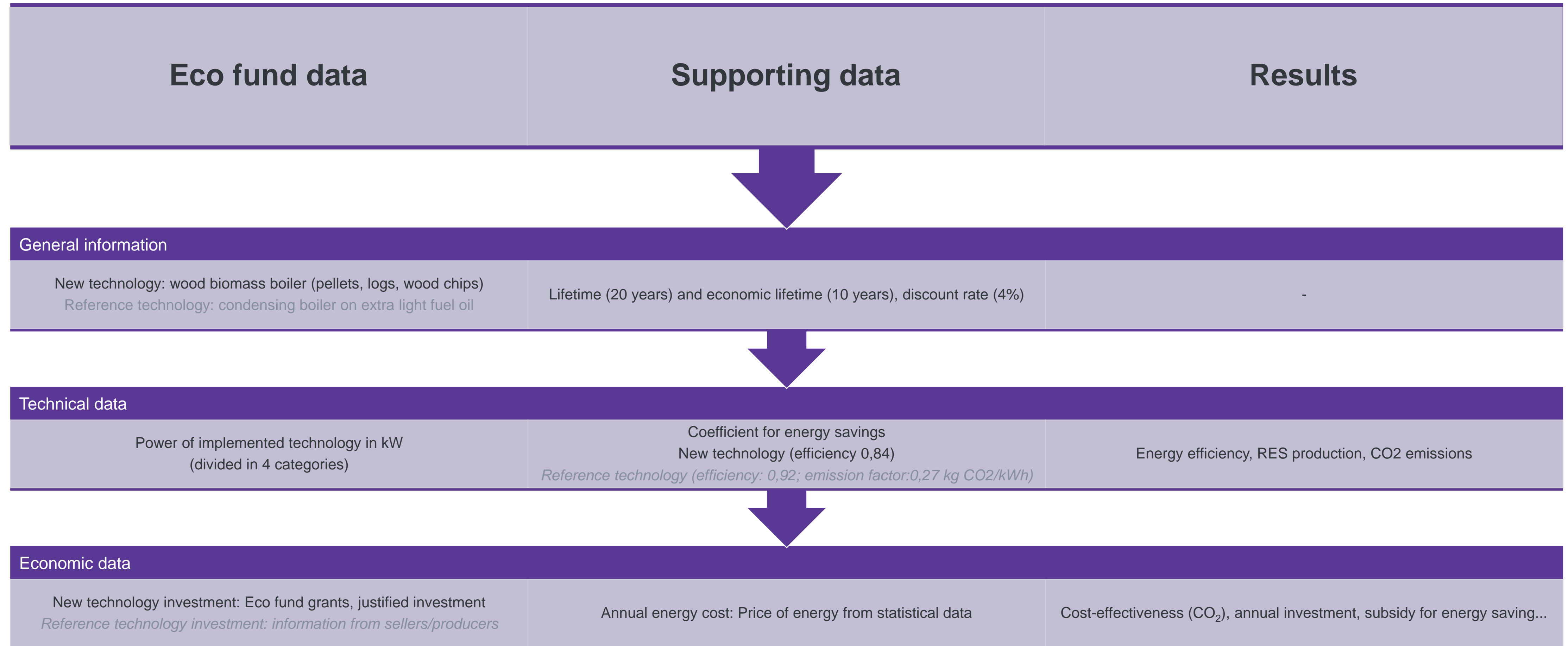
New technology replacing:

- **average mix of fuels** (emission factor 0,09 kg CO<sub>2</sub>/kWh)
- **extra light fuel oil** (emission factor 0,27 kg CO<sub>2</sub>/kWh)
- **natural gas** (emission factor 0,20 kg CO<sub>2</sub>/kWh)





# Ex-ante: new technology vs reference technology



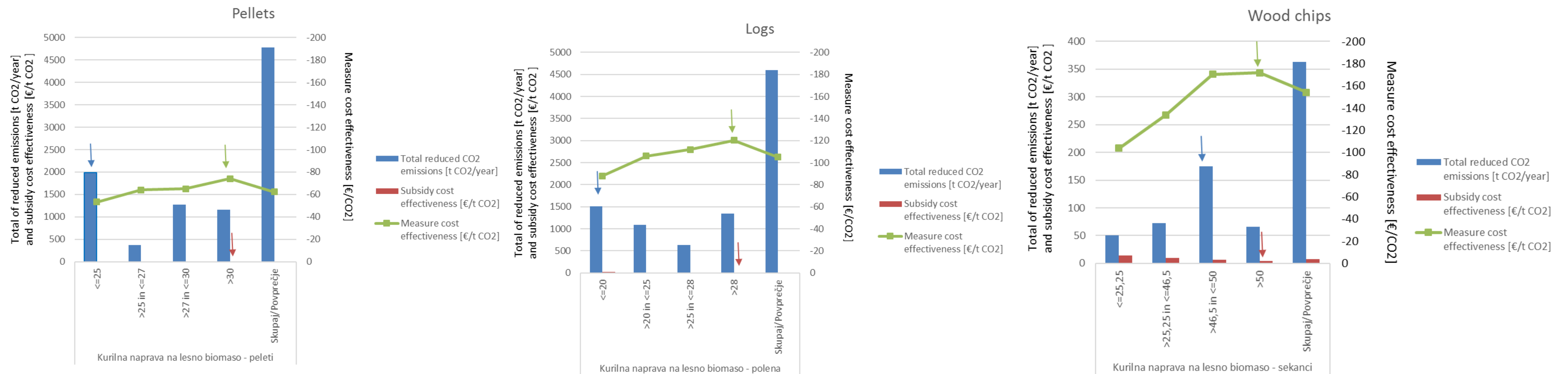
# Ex-ante

## Results

Measure for wood biomass boiler (pellets, logs, wood chips):

- emission factor - extra light fuel oil
- divided into 4 groups by power

Conclusions of cost efficiency are similar to the one in Ex-post but are specific to some extent due to different input assumptions for reference technology.



# Ex-post and Ex-ante Results

Measure	Classes by nominal power of the device	Total reduced CO2 emissions	Subsidy cost effectiveness	Measure cost effectiveness	Number of paid incentives	Measure	Classes by nominal power of the device	Total reduced CO2 emissions	Subsidy cost effectiveness	Measure cost effectiveness
	kW	t CO2/year	€/t CO2	€/t CO2			kW	t CO2/year	€/t CO2	€/t CO2
EX-POST wood biomass boilers - pellets	<=25	922	25	-2	199	EX-ANTE wood biomass boilers - pellets	<=25	1.984	11	-53
	>25 in <=27	171	22	-25	31		>25 in <=27	368	10	-64
	>27 in <=30	592	19	-27	98		>27 in <=30	1.273	9	-65
	>30	537	14	<b>-47</b>	80		>30	1.155	7	<b>-74</b>
	Sum average	2.221	20	-21	408		Sum average	4.781	9	-62
EX-POST wood biomass boilers - logs	<=20	703	39	-77	177	EX-ANTE wood biomass boilers - logs	<=20	1.514	18	-88
	>20 in <=25	509	29	-116	103		>20 in <=25	1.095	13	-106
	>25 in <=28	295	27	-128	53		>25 in <=28	635	13	-112
	>28	627	22	<b>-146</b>	96		>28	1.348	10	<b>-120</b>
	Sum average	2.134	30	-113	429		Sum average	4.592	14	-105
EX-POST wood biomass boilers - wood chips	<=25,25	23	32	-110	5	EX-ANTE wood biomass boilers - wood chips	<=25,25	50	15	-104
	>25,25 in <=46,5	34	22	-175	5		>25,25 in <=46,5	72	10	-134
	>46,5 in <=50	81	14	-254	8		>46,5 in <=50	175	7	-170
	>50	31	10	<b>-257</b>	2		>50	66	4	<b>-172</b>
	Sum average	169	17	-219	20		Sum average	363	8	-154



# Ex-post and Ex-ante Results

Most subsidized  
wood biomass boiler

Low power  
technology



Ex-post and Ex-ante  
cost effectiveness

High power  
technology

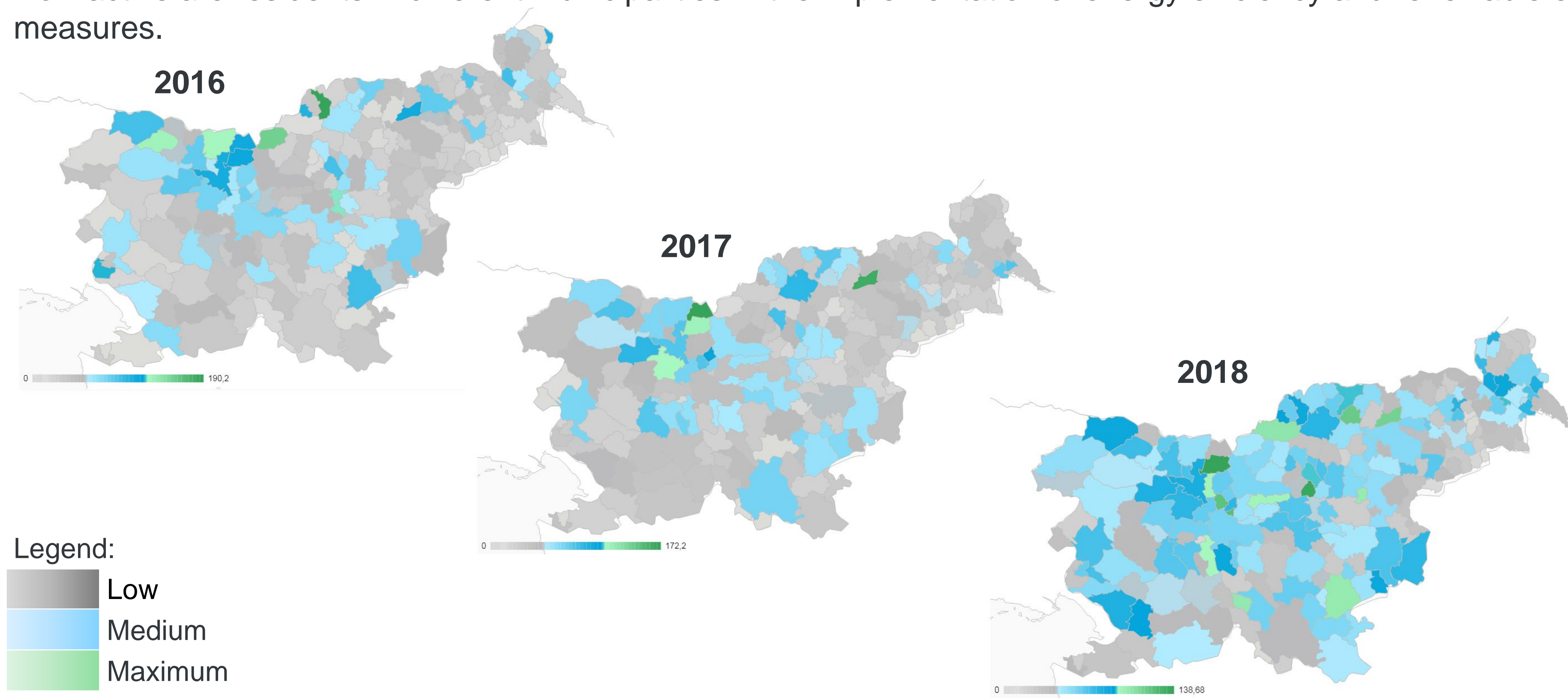
From the CO<sub>2</sub> emission reduction point installing small power boilers was not as efficient as was it for installing bigger power boilers

Exception wood biomass  
boiler – wood chips

# Local climate action scoreboard

The value of incentives invested by the Eco Fund per capita (€/capita)

How active are residents in different municipalities in the implementation of energy efficiency and renewable energy measures.



# Local climate action scoreboard

## Energy poverty

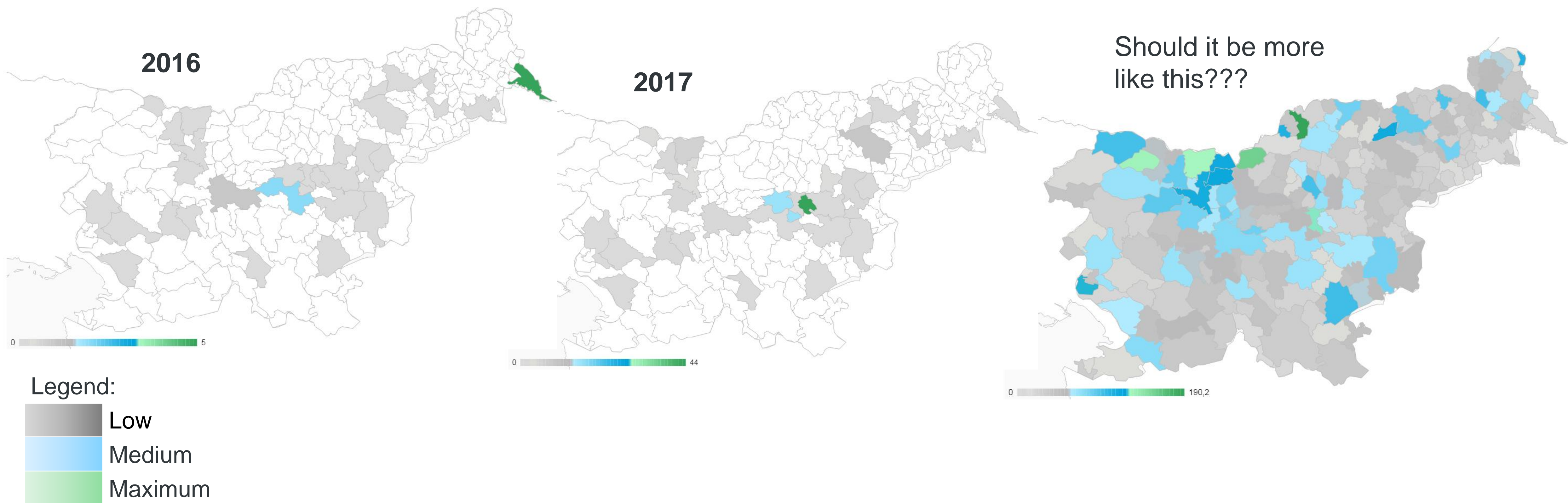
- 40 % of household can't afford to take action in renewable energy and energy efficiency measures.
- 2015 there was 820.541 households in Slovenia
  - ▶ 40 % → 328.216 households
- (Too) slow progress and low numbers of included households. What are we missing?



# Local climate action scoreboard

## Energy poverty

The indicator shows the number of households in the energy poverty reduction program and is defined as the number of free advice provided on the ground by independent energy consultants of the ENSVET network under the ZERO program, which is managed and coordinated by the Eco Fund.





# Thank you!