4 (of the) blind spots in Danish energy policy-

CO2 reduction and improved economy!!

INFORSE – Europe
Sustainable Energy Seminar

Nordic Folkecenter for Renewable Energy, Denmark
17 August 2021

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Proceedings at: https://www.inforse.org/europe/seminar_2021_INFORSE-Europe_DK.htm

Blind spot 1:

Lack of policies for consumer/citizens ownership

Reference: Price Efficiency, Green Transition and Channels for Regulating Natural Monopolies:
The Case of the Distribution System Operators (DSOs)
Frede Hvelplund, Finn Arler, Henrik Lund
From: Energy regulation in the green transition , Danish Utility regulator 2021

https://forsyningstilsynet.dk/media/8866/danish-utility-regulators-anthology-project-series-on-better-regulation-in-the-energy-sector-vol-1.pdf

The four levels of governance

a. Consumers regulative power through the state regulatory unit.

b. Consumers buying power through the market

c. Through Consumers ownership power

d. Consumers communicative power through cost and price transparency and democracy

Here we have focus upon ownership power and governance

A. Energy price and ownership

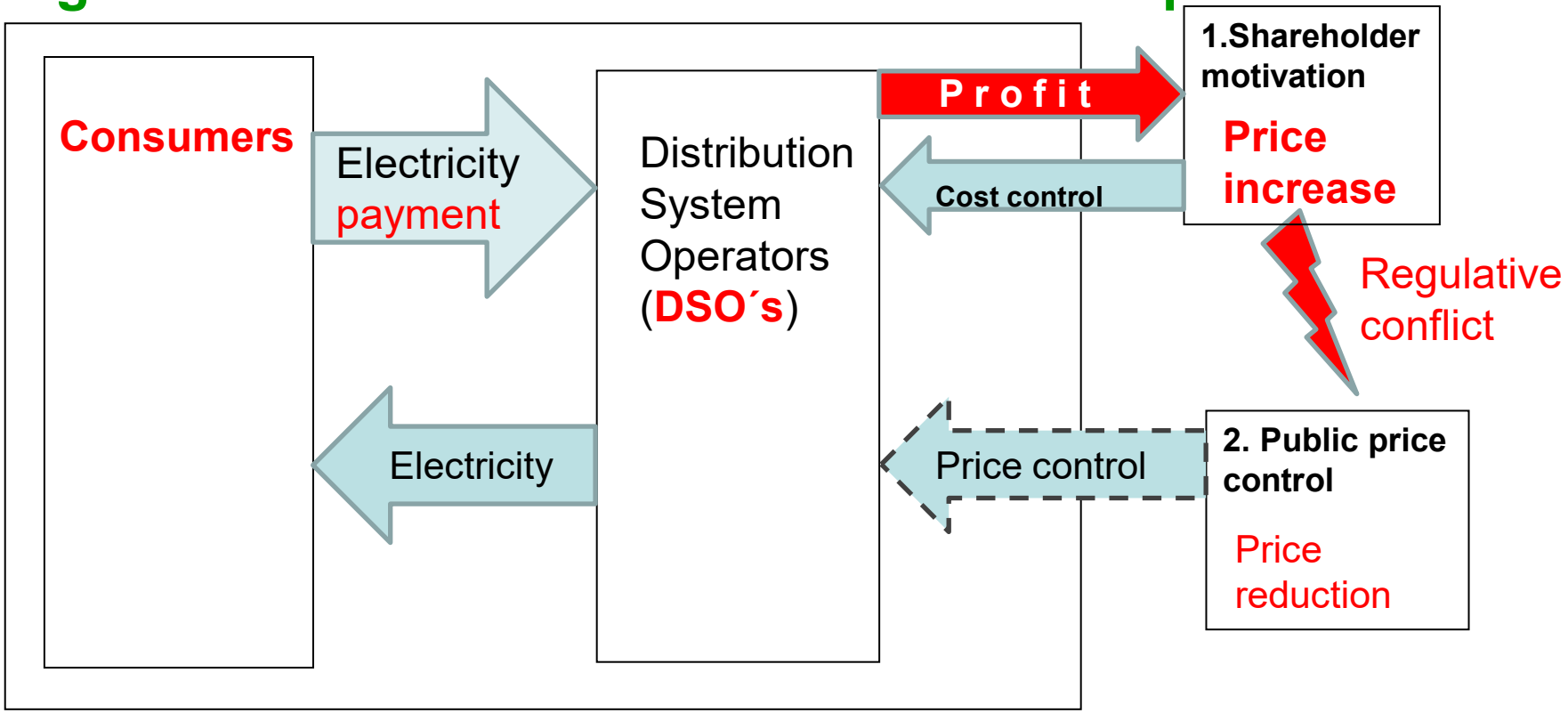
Shareholder owned DSO

RADIUS

COPENHAGEN DSO

Motivation for high prices in a external shareholder owned DSO

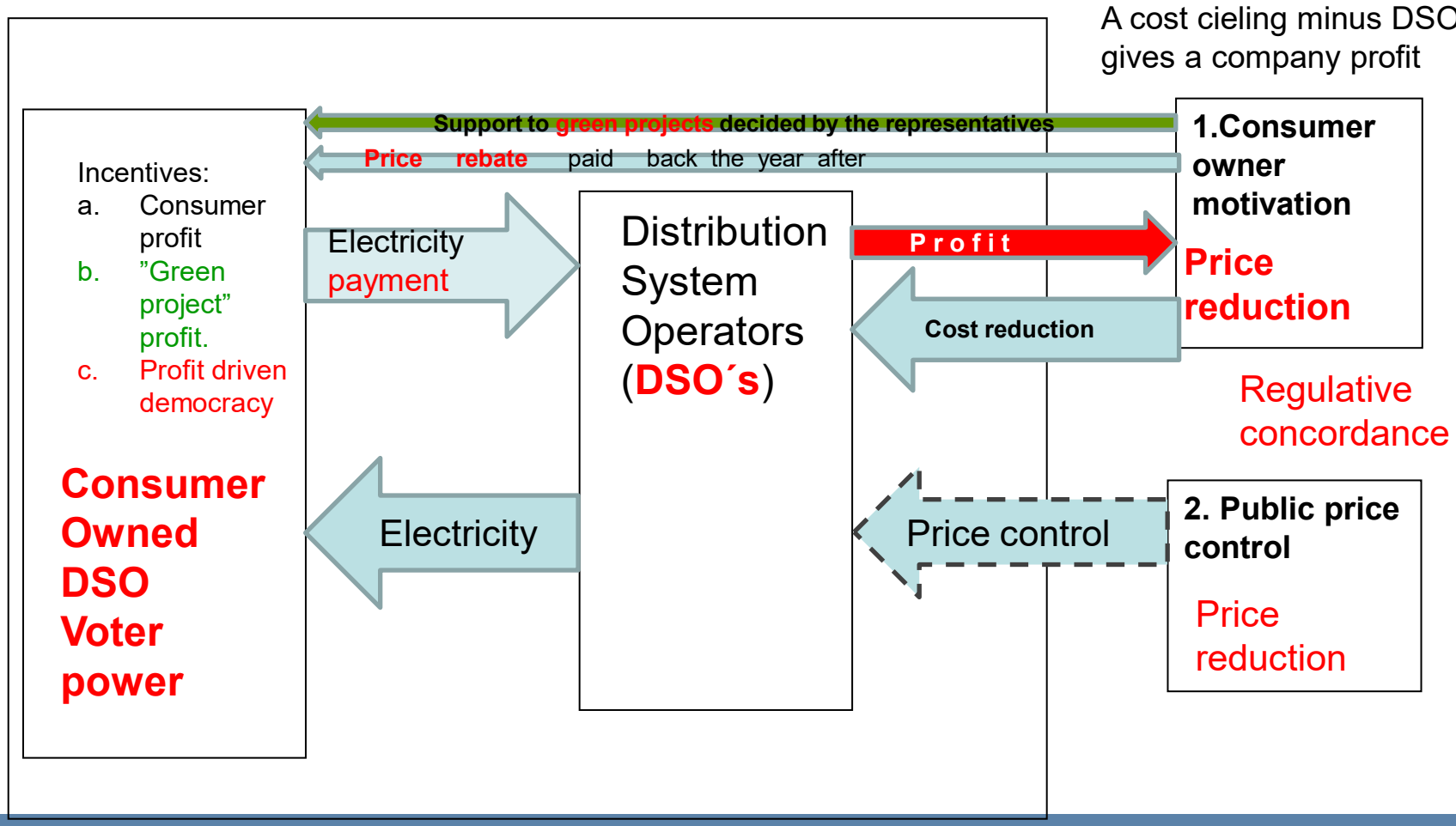
STOP!!!: But price increases are subued to public regulation!!!??? So RADIUS cannot earn a profit! !!!??



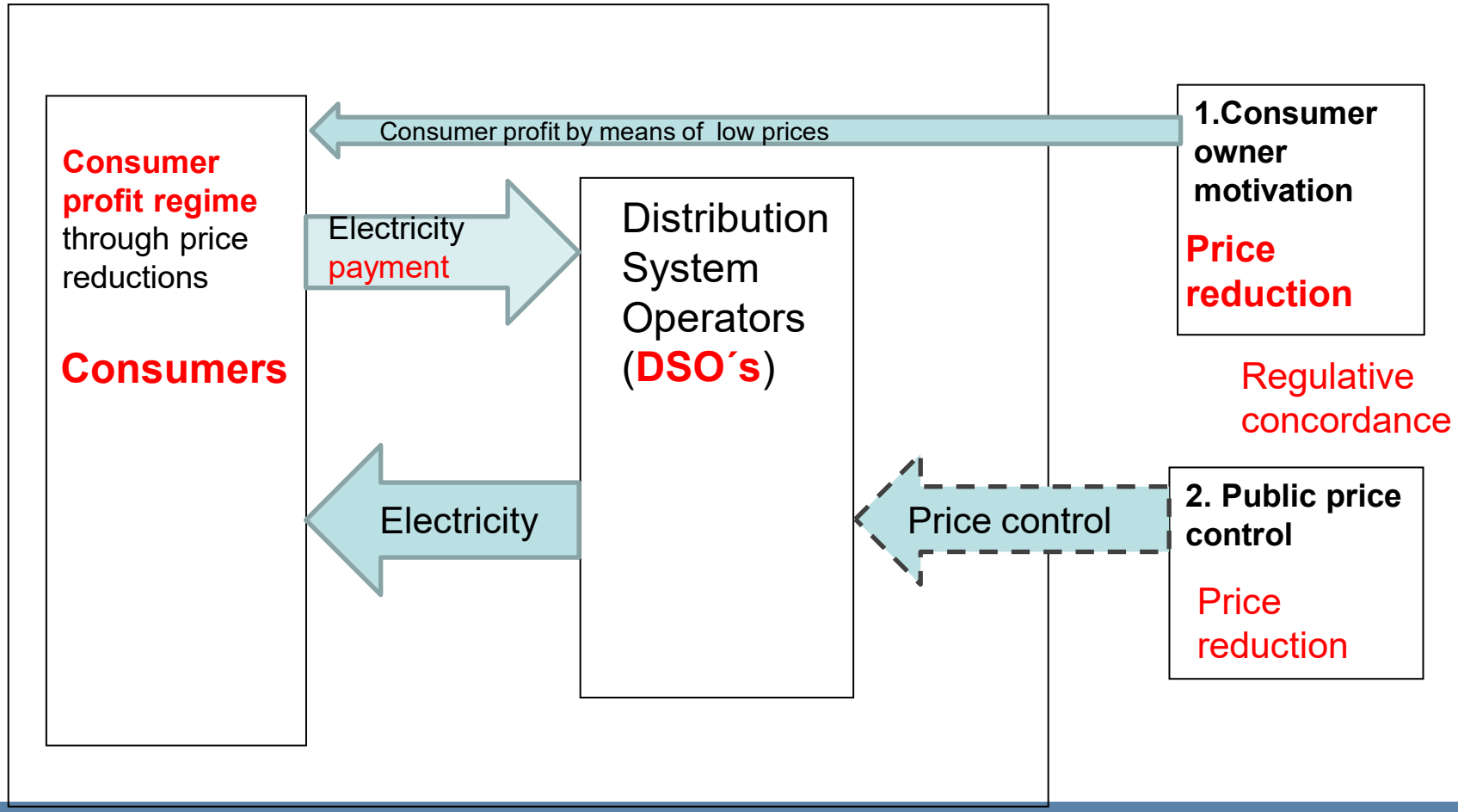
Consumer owned DSO,
KONSTANT
Aarhus

Motivation for low prices and green projects

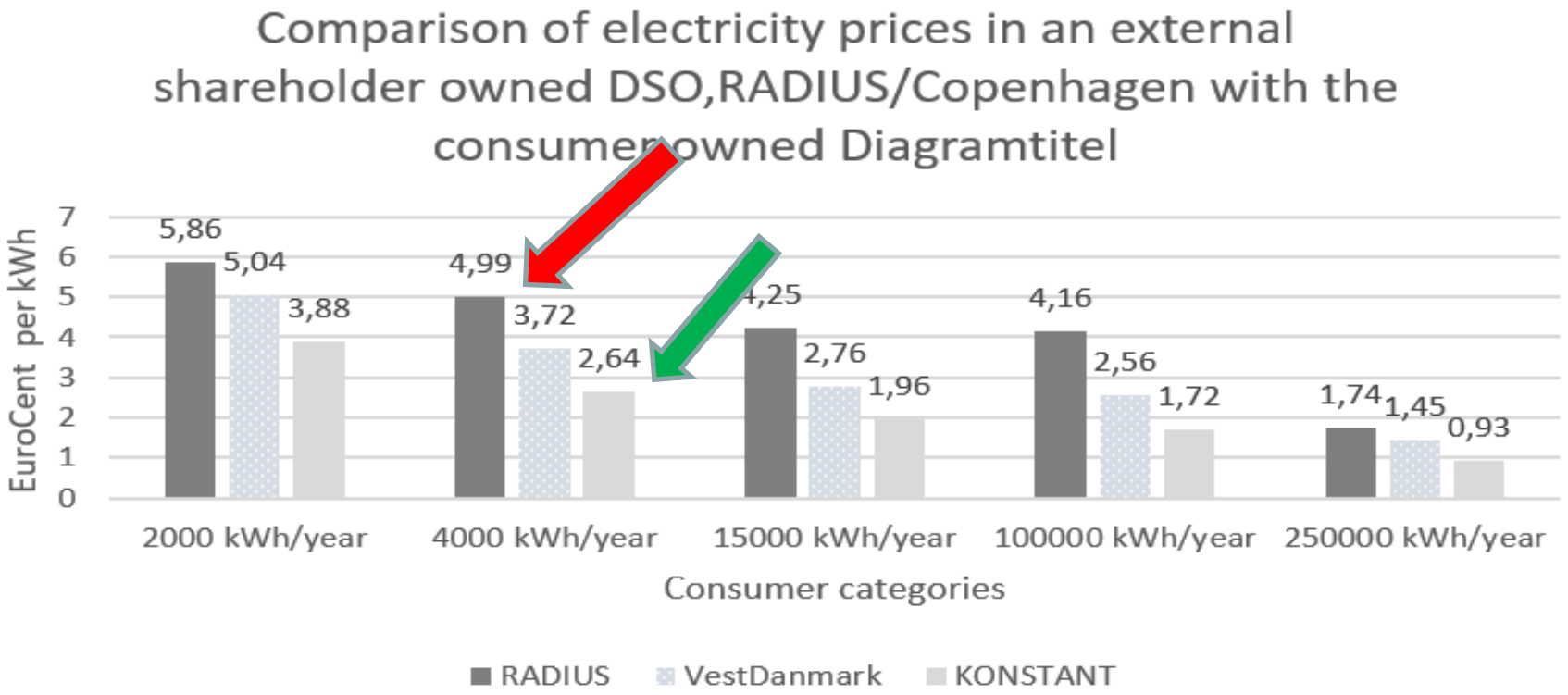
in a consumer owned DSO (New income frame regulation)



Motivation for low prices in a consumer owned DSO under a non profit regime. (Old ”hvile i sig selv”/consumer profit)

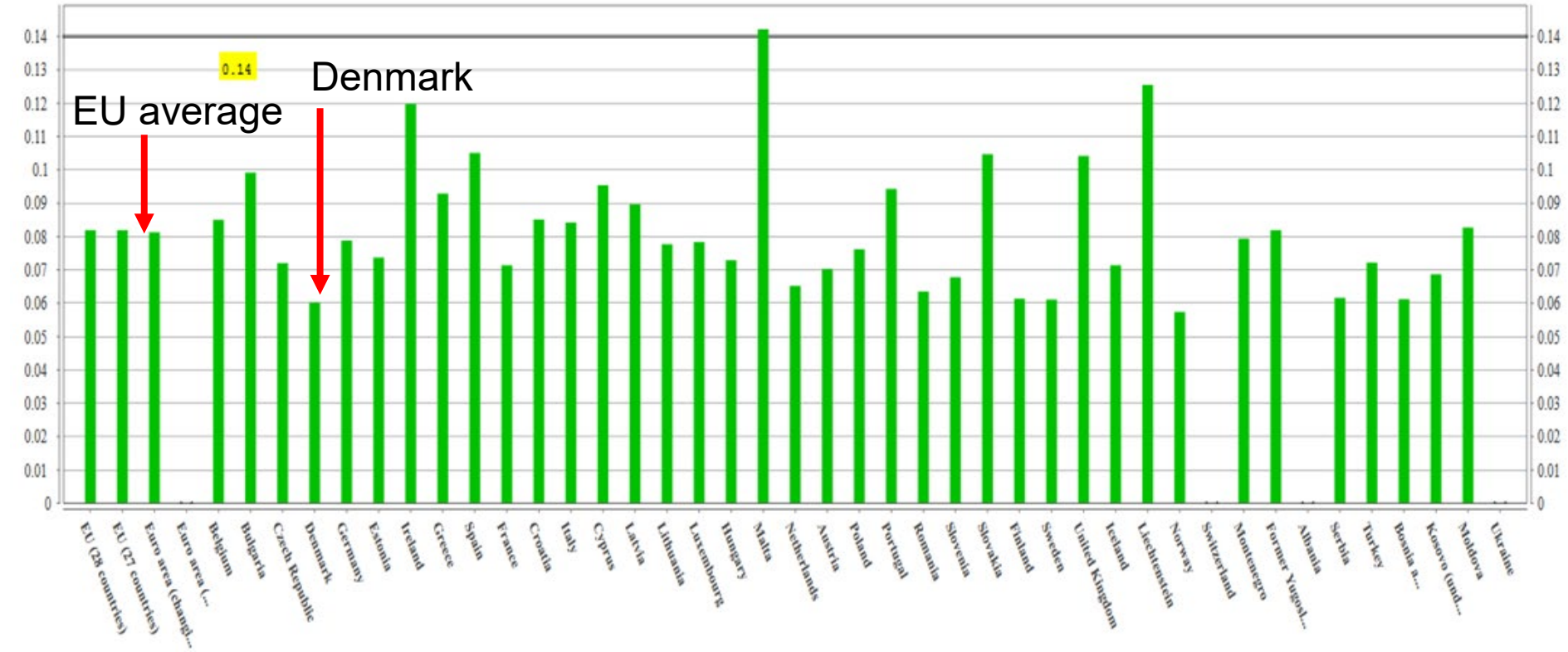


SHAREHOLDER DSO, RADIUS IS 90% MORE EXPENSIVE per kWh THAN THE CONSUMER OWNED KONSTANT.



Reference: Hvelplund,F, Arler,F, Lund,H 2020

EU electrcity prices for small companies (2017)



Reference:
http://ec.europa.eu/eurostat/tgm/mapToolClosed.do?tab=map&init=1&plugin=1&language=en&pcode=ten00117&toolbox=types

B: Innovation and ownership

SOME INTEGRATION INFRASTRUCTURE TECHNOLOGIES

1. **Base:** A consumer and municipality owned district heating infrastructure.
2. Heat pumps and heat storage systems.
3. Low temperature district heating.
4. Wind power for district heating in combination with heat pumps and hot water storage.
5. Geothermal energy
6. Solar energy for heat (and cooling) in combination with season storage systems.
7. Low temperature industrial heat.
8. **40% Heat conservation**
9. Wind to gas systems.
10. Wind-transportation infrastructure

The green energy transiton technologies (in most cases) are **much closer to the consumers** than the coal mines– shipping systems-and central power plants they replace.

So we are dealing with a transition from consumer distant to consumer near technologies and value-added.

This gives the DSOs new roles in the green transition

Suggestions for Danish policies – a continuation of historical consumer and municipality ownership plus-

1. A systematic heat conservation policy that aims at 40% reduction of heat consumption in 2050.
2. A requirement of at least 51% local and consumer ownership of wind power (onshore) in plant lifetime.
3. At least 51 % co-operative ownership of offshore plants in their lifetime.
4. Requirement of around 30% of plant surplus to local and regional environmental purposes.
5. Wind turbines ownership preference should be given to actors having invested in wind power integration. For instant district heating companies.
6. The role of the large power companies could be to engage in an ownership collaboration with local consumers and municipalities.

Suggestions for EU policies

1. Implementation of an energy subsidiarity principle.

2. Same level of subsidies to local and regional integration as at present to interconnectors.

3. Clear EU acceptance of policies that supports local and regional ownership of majority shares of renewable energy systems.

Conclusion

Results of the right type of consumer/municipal ownership in an open transparent democracy with a non profit governance system.:

1. It results in **low consumer prices** that has made, and still makes, ”first mover” innovative investments in new renewable energy technologies economically possible.
2. It supplies consumer price control in a natural monopoly, where buying power supplies ocnsumer price control in ”free markets”.
3. It may result in **low innovation transaction** costs linked to both investment and operation & management of coordination tasks in smart energy systems.
4. It supports a democratic energy system learning processes.
5. **CO2 reduction and improved economy**!!

Blind spot 2.

No efficient traffic policy

The number of private cars (2.6 millions in 2020 and exp. 3.3 mill. in 2030) does not represent an economic optimum, but is a result of systematic market failures.

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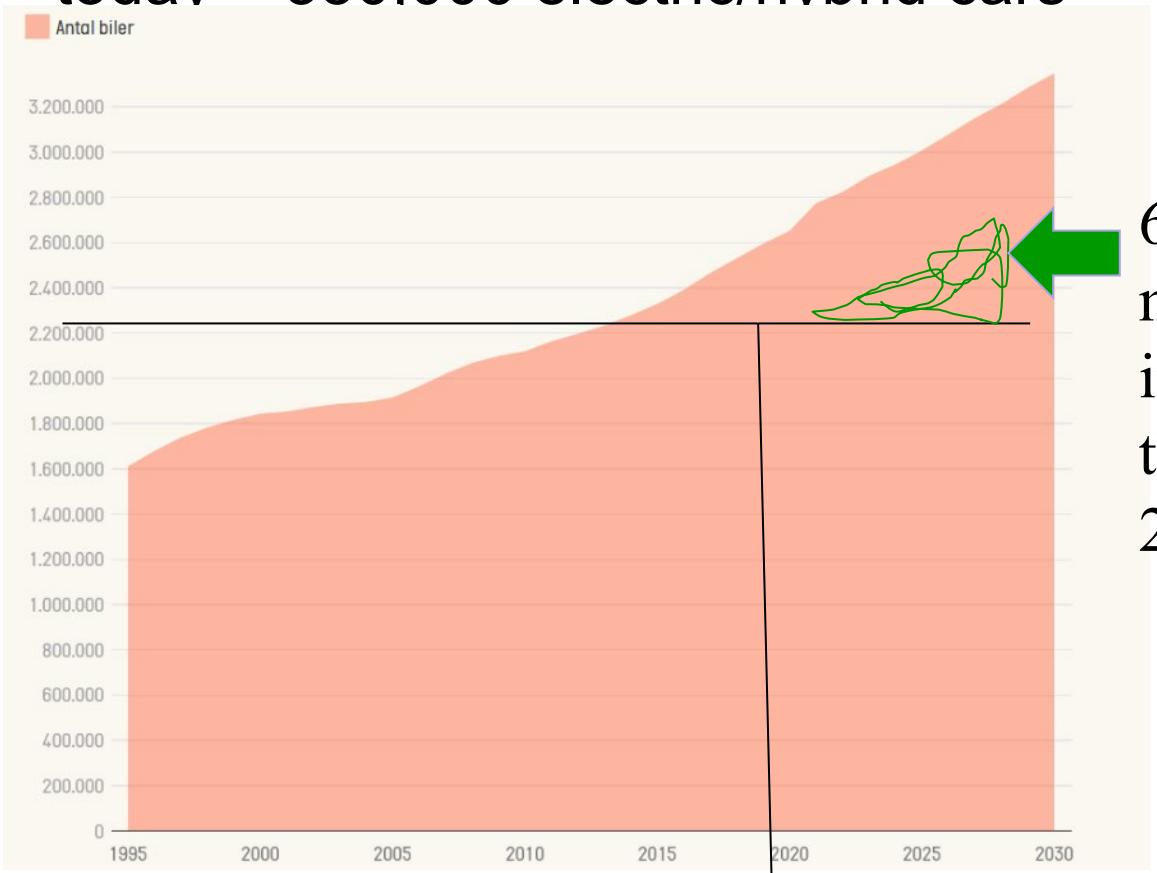
Present policy: Around 250,000 more fossil cars in 2030 than today + 350.000 electric/hybrid cars



600,000 more cars in 2030 than in 2021

Thomas Hebsgaard: https://www.zetland.dk/historie/soGP1QBy-ae6XddK5-44c73

Total failure regarding private car CO2 reduction by 70% from 1990-2030

	2. CO2 emission 1990	3. Present official CO2 emission goal 2030	4. E mission with 70% reduction from 1990-2030	5. CO2 reduction underperformance 1990-2030
Annual CO2 emission in mill. tons.	**5.2**	**6.0 (3.5 IDA)**	**1.6**	**4.4 (1.9 IDA)**

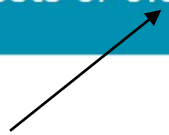
Social costs of car km.

European Commission

Science for Environment Policy

Individual and social costs of car travel more than six times those of cycling

Every kilometre travelled by car incurs costs to the individual and society that are more than six times those of travelling by bicycle, a new study suggests. The researchers presented a cost-benefit analysis developed for Copenhagen, finding that cars resulted in costs of 0.50 €/km in comparison to 0.08 €/km for bikes.



Short and long term costs of private cars/km km.

	1.Private car drivers incentive for **next tour with present tax**	2.Social costs Copenhagen)	3. Market failure/ **Loss per km with present tax system!!**	4. Public transportation
Short term costs/km Drivers incentive	30-80 øre/km	350-400 øre/km	300-350 øre/km	
Long term costs/km (should we have a car or not incentive)	250-350 øre/km			Ticket price per km 100-300 øre/km

Competition scene.

Areas of market failures

1. Social loss due to ”Too many driven car kilometers”. Drivers ”incentive costs” lower than societal costs.

2. Social loss due to wrong incentive structure between cars and public transportation. (Cars short term costs versus public transportation tickets/long term costs)

The present private car tax and price system subsidises car owners that drives many km.

- In general a car owner that drives 30,000 km/year pays the same insurance premium and weight tax as a car owner that drives 5,000- 10,000 km/year.
- This is a badly substantiated subsidy from few km/year car drivers to many km/year car drivers.
- Insurance and weight tax is around 40 øre/km for a 20,000 km per year car.
- A very moderate change in tax system would be to make weight tax and insurance premium km dependent, equivalent to 40 øre/km. (I am sure that this very moderate change will meet though resistance- in fact a share of the car tax could also be changed to become km dependent)

Effect of a km tax of 40 øre instead of the present km independent weight tax and insurance premium

km/year	Present tax/insurance	Proposed km tax 40 øre/km	Change of tax
Car A:10000	6000	4000	-2000
Car B:15000	6000	6000	0
Car C: 20000	6000	8000	+2000

Short and long term costs of private cars/km km.

	1.Private car Drivers incentive for next tour with new tax system	2.Social costs	3. Market failure/ **Loss per km with proposed tax system!!**	4. Public transportation
Short term costs/km Drivers incentive	120 øre/km	350-400 øre/km	200-300 øre/km	
Long term costs/km (should we have a car or not incentive)	250-350 øre/km			Ticket price per km 100-300 øre/km

Competition scene.

Result of the policies

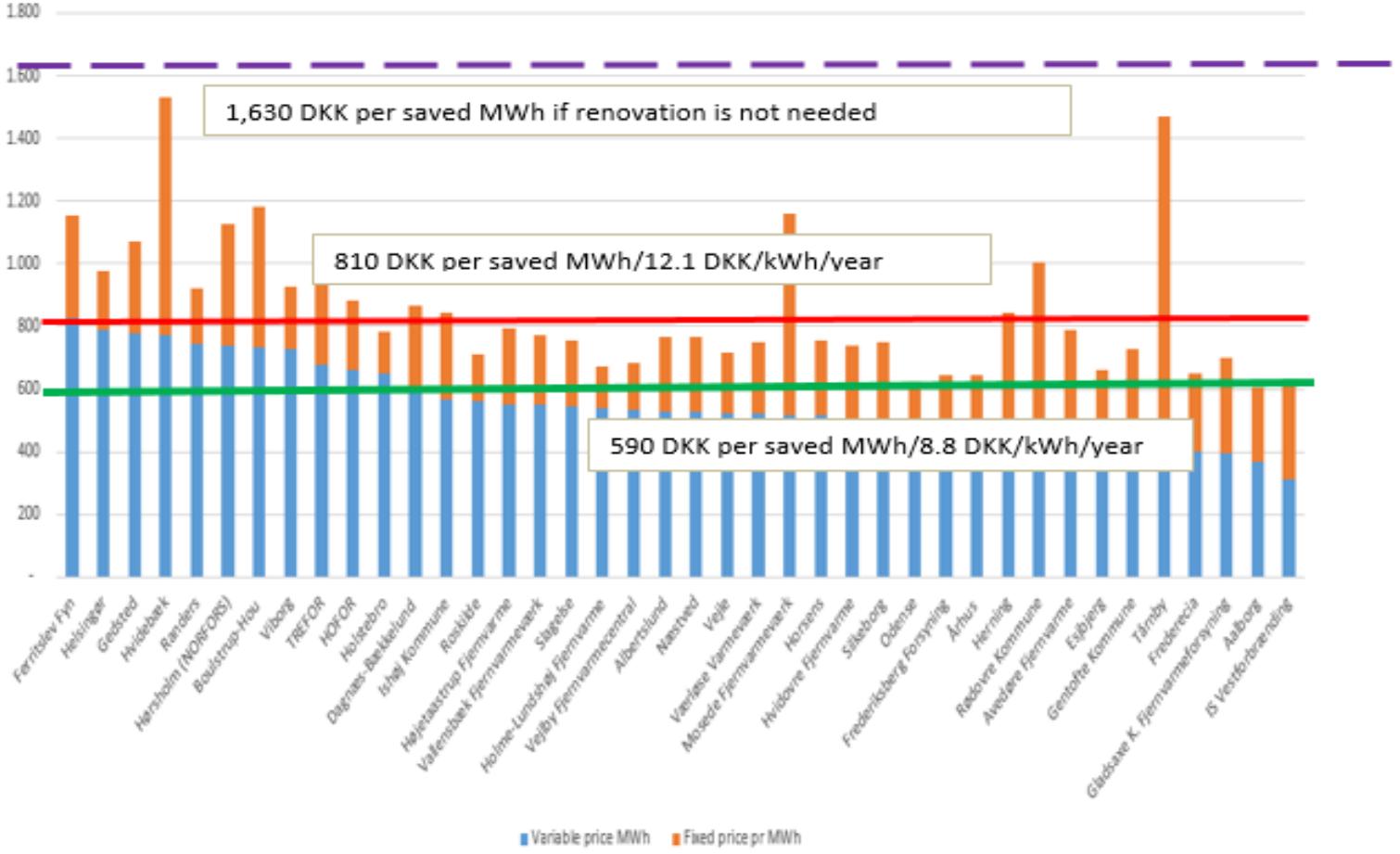
a. Reduced CO2 emission

b. Richer society

Blind spot 3:

No efficient energy conservation policy.

Heat conservation costs (horisontal line) at 20 years



3 simple heat conservation reforms

(They could be the national consequence of the energy conservation directive)

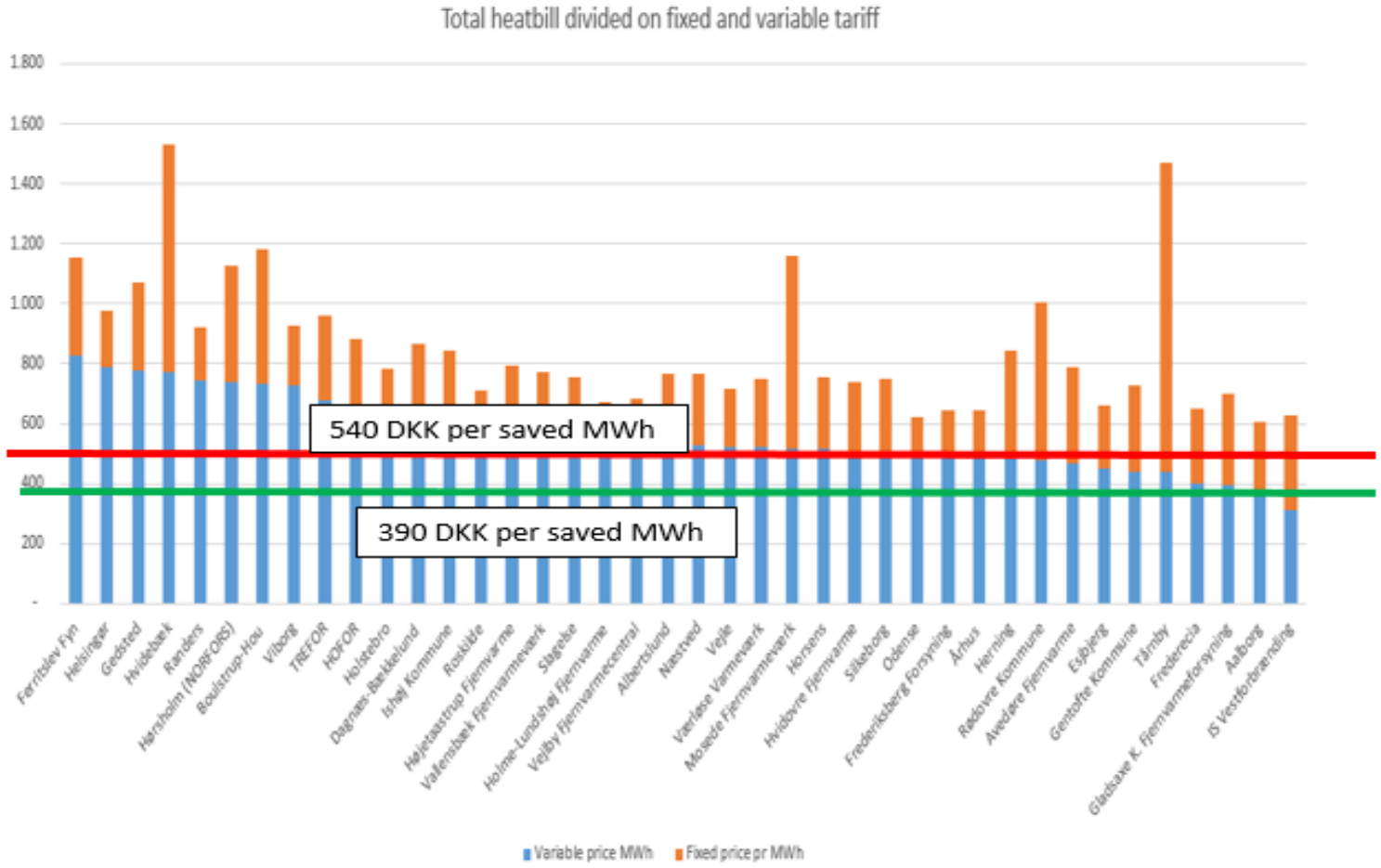
1. Abolish fixed tariffs

2. Establish public guaranty for 1% / 30 year heat conservation loans.To measures recommended by the energy consultant.

3. Give 50% in subsidy to energy consultants

Heat conservation costs at 30 year loans and 2% interest.

Figure 5. The effects of the three policy reforms.



Policy results

a. Lower CO2 emission
b. At potential no costs, as the present tariff structure with high fixed tariffs may respresent a market failure.

Name: Frede Hvelplund

Blind spot 4.

Lack of policies for low energy societal structures.

Transition to low energy societal structures

Green energy sector policies alone can end up as a technological fix that does not fix the climate problems due to the ongoing more and more energy intensive societal structures.

Coming energy transition projects should not only deal with a green energy sector transition but also with a transition to less energy and ressource consuming societal structures.

Low energy societal structures

- Reduce distance between producer and user. Decrease instead of – as today- increasing the numbers of food miles.

- Support smart energy systems and conservation. (Economic subsidiarity principle)

- Support local ownership of energy systems

- Reduce structural subsidies to private car transportation. For instance tax reduction related to pendling, road pricing etc.
- Increase public education supporting close to consumer production systems

Conclusions

Frede Hvelplund

There is a strong need for integrating green energy sector policies with policies for low energy societal structures.

-This requires new economic ressources and new collaboration models.

-Tax on CO2

-Import tax on CO2

-Tax on ship and air transportation

- Reduction of infrastructural subsidies to cars and trucks