

Intelect

Incentives and actual cost calculations for electric transport in the Nordic countries

Oil prices



Oil is still cheap

- If taxes or/and subsidies are excluded, oil is still cheaper than biodiesel, ethanol, biogas. etc.
- It is also usually cheaper than electricity
- 1 L. of gasoline = 10 kr/kWh
- Electricity costs = 10 kr/kWh
- It is the efficiency of the electric motor that makes the running cost of electric vehicle 3-4 times cheaper than conventional car.
- The electric car is still more expensive to buy

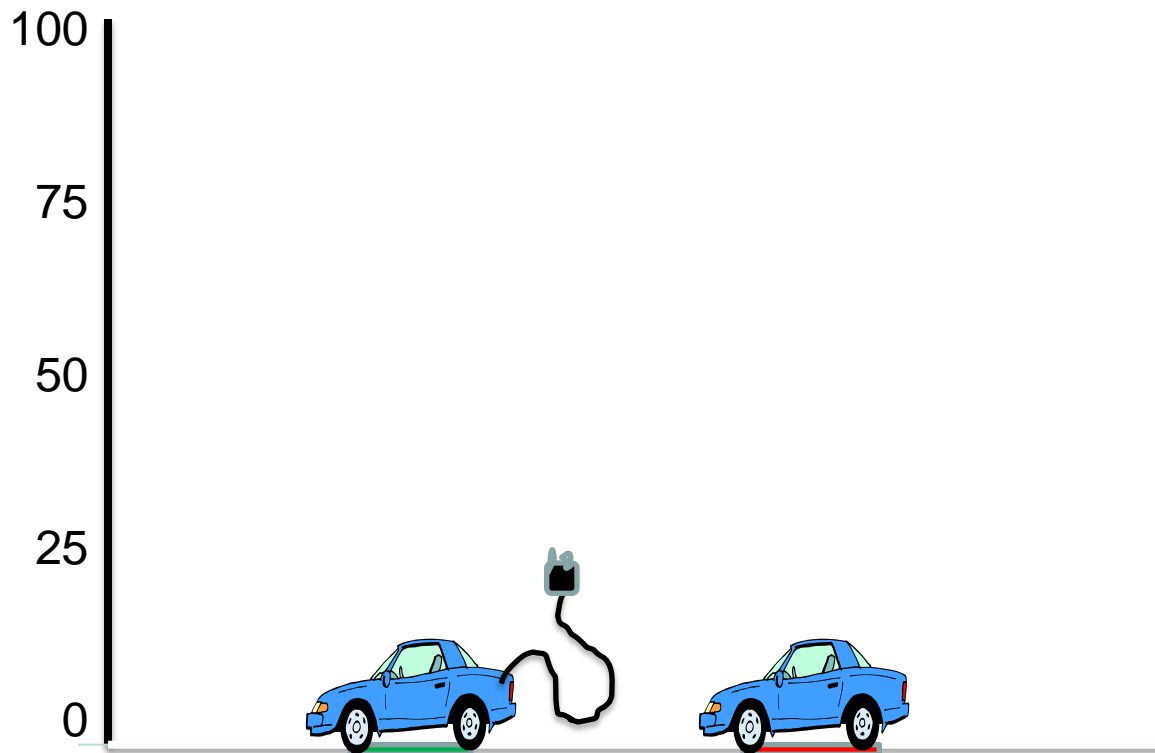
Why bother?

- Many believe the future is likely to include higher oil prices and/or lower battery cost
- We have to switch from oil to something else at some point simply because oil is a non- renewable resource
- Incentives are needed to implement this inevitable change in fuel

Taxation

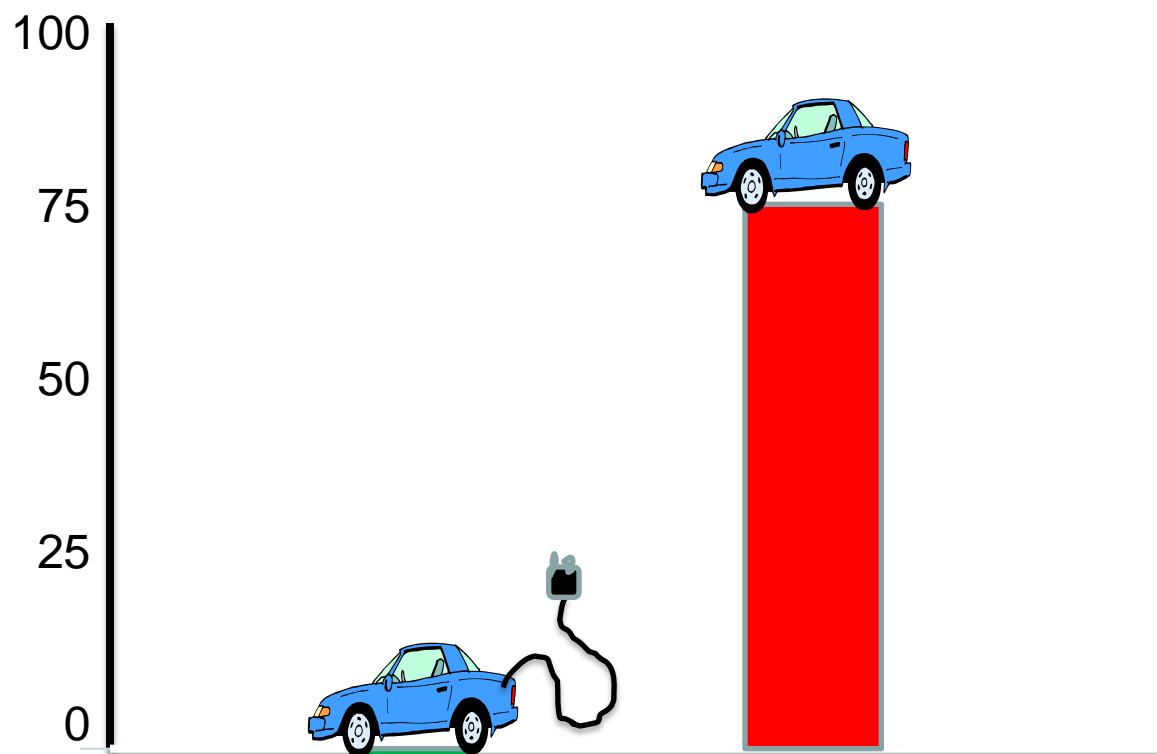
- Import tax
- VAT
- Annual tax
- Fuel tax

No tax



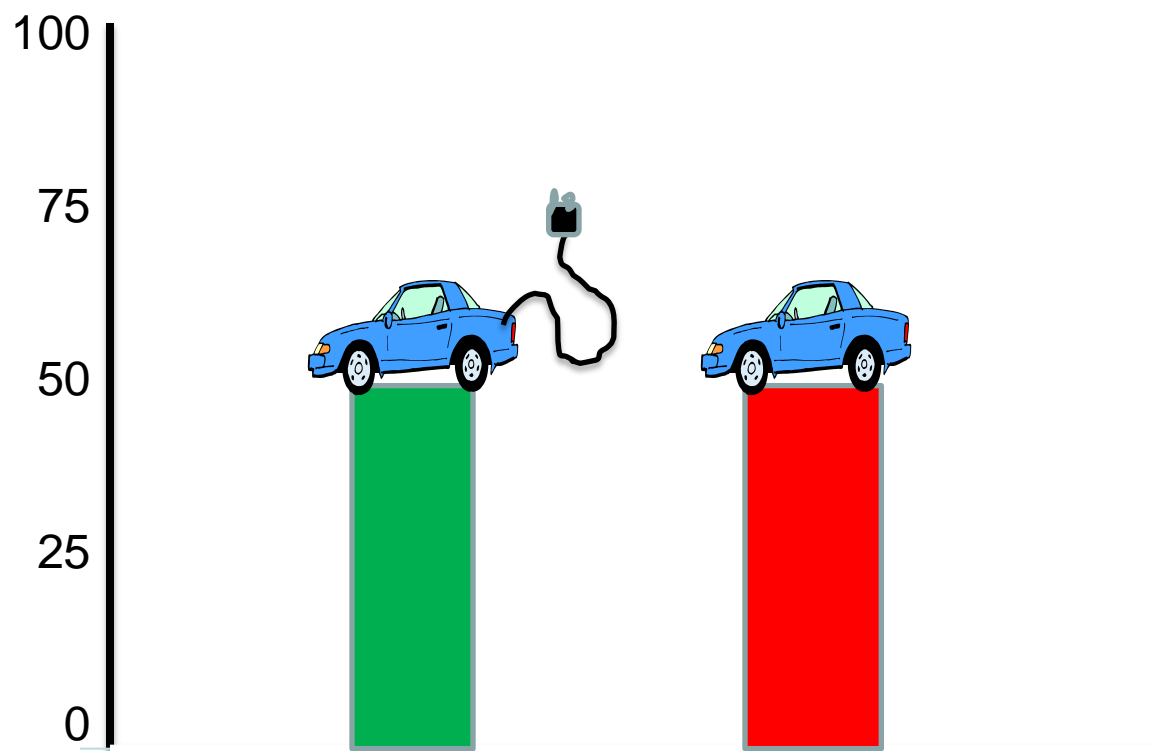
Total tax = 0

New tax



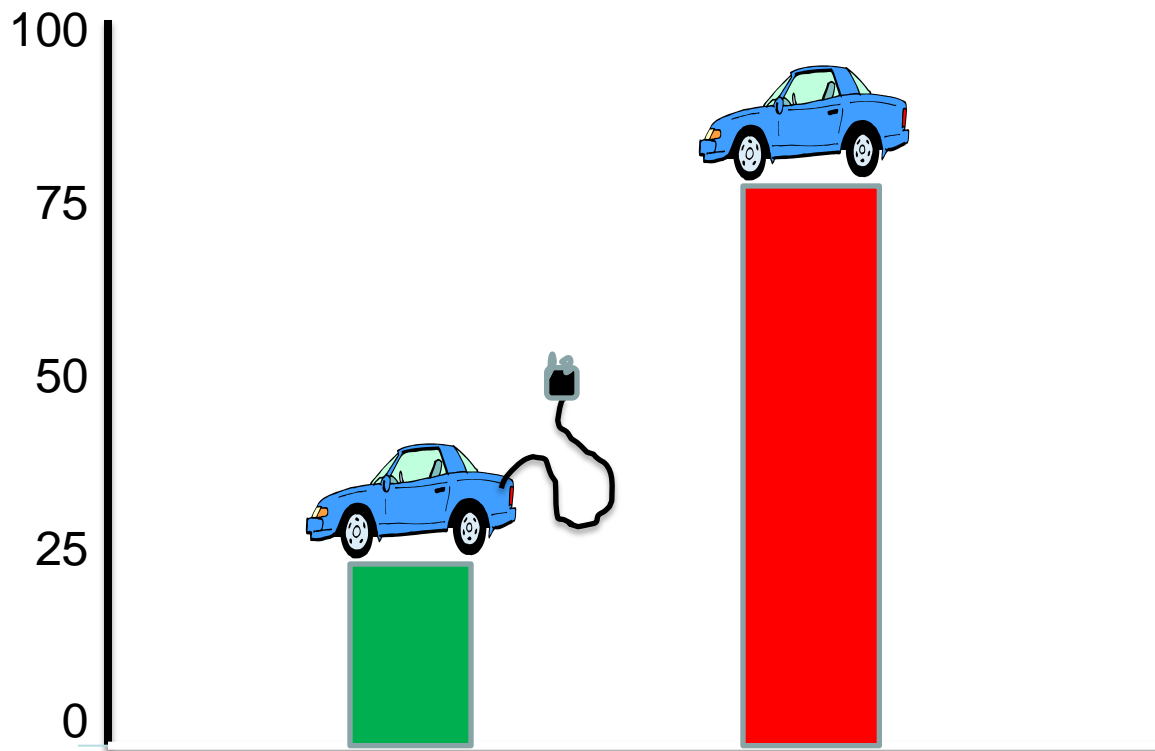
Total tax = 75

Tax changes



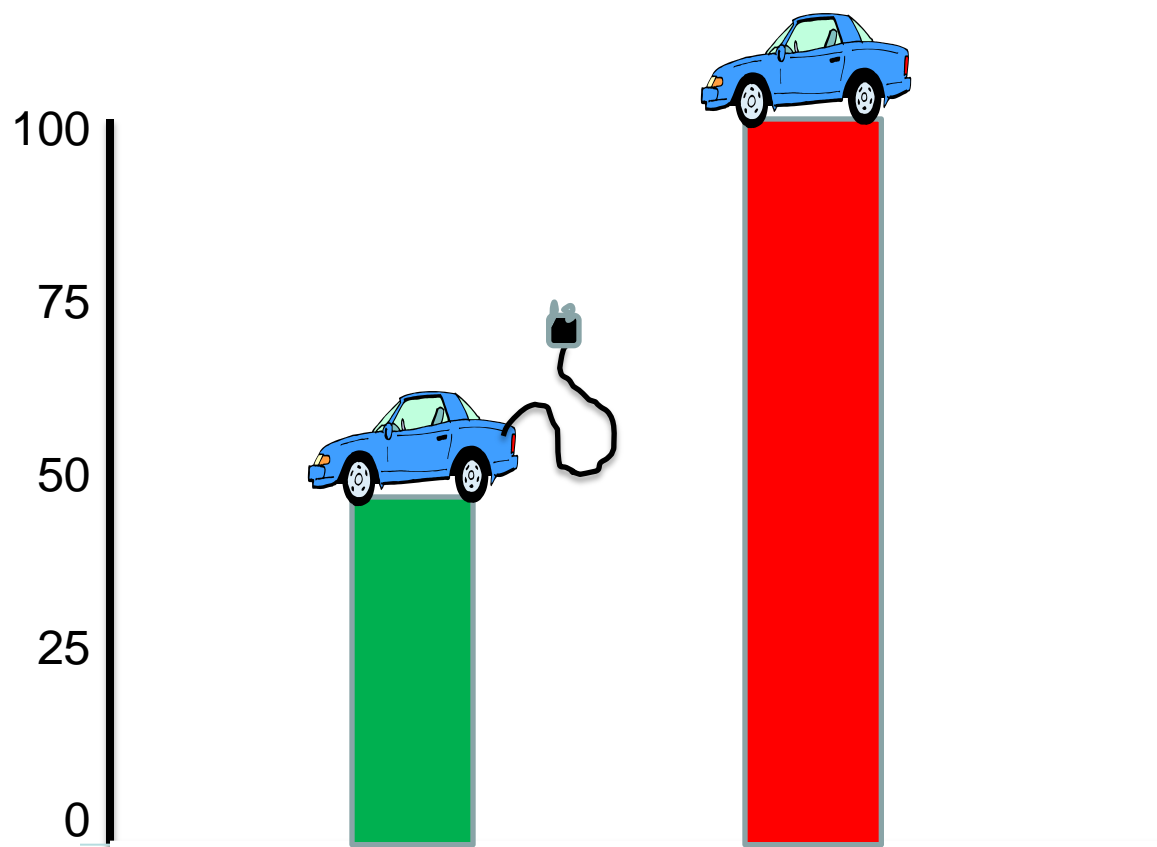
Total tax = 100

Same total tax



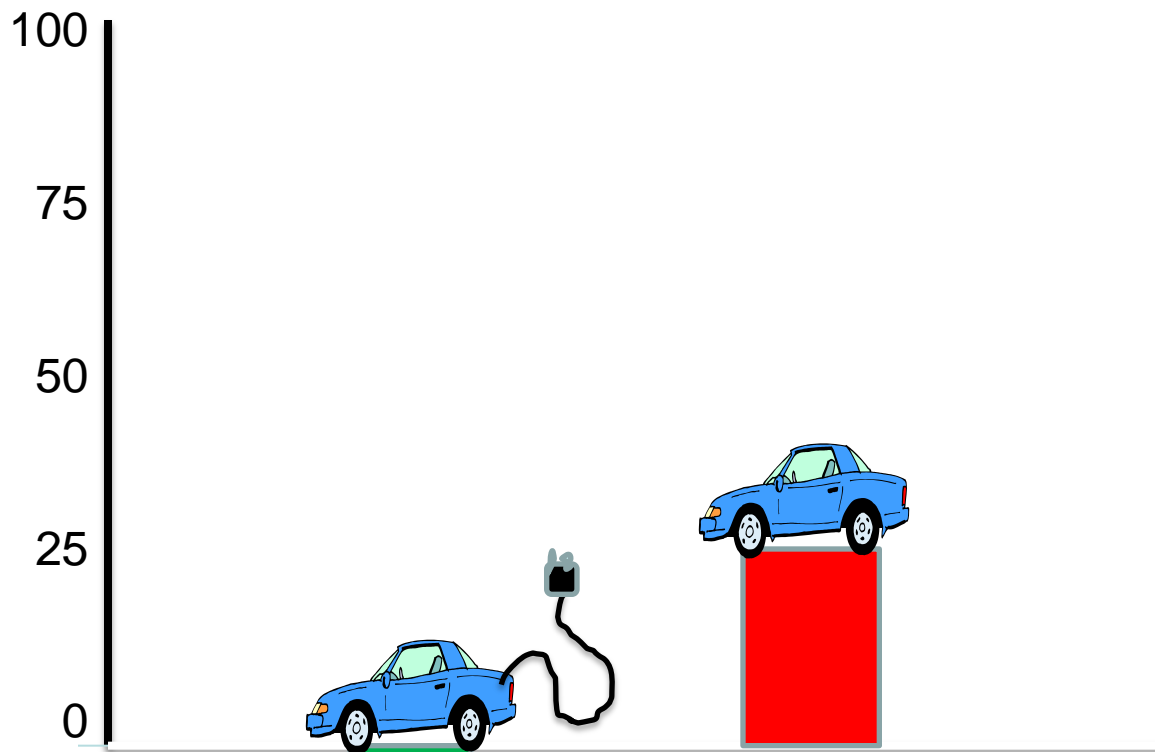
Total tax = 100

Higher taxes



Total tax = 150

Lower taxes



Total tax = 25

Taxation

- Existing taxes gives the opportunity for low tax, same tax or higher tax policy.
- **Just keep the difference if you want to make changes in the private car fleet !!!**

INTELECT

- All of the Nordic countries have taken steps towards increasing the use of environmentally friendly transport
- As part of their policy different incentives have been put in place
 - They are different on country and city level
 - They are physical and non-physical
 - Some have worked well others not as well
- Different regulations also exist
 - Barriers
 - Certification
 - Homologation
 - Fuels

INTELECT / barriers

- Regulatory barriers
- There seem to be no barriers for the introduction of environmentally friendly vehicles in the Nordic countries
 - Governments have actually been very positive for demonstration activities etc and supported such activities
 - Including
 - Homologation - certification
 - Fuels
 - Other



iMIEV at fuel source

INTELECT objective

- Map vehicle taxation and available incentives in all of the Nordic countries, including
 - Governmental incentives
 - Financial, tax, etc
 - Municipal incentives
 - available incentives in the 3 largest municipalities (Faroe Island and Greenland are different as only the capital areas will be used)
- Build online calculators to help customers to evaluate the pros and cons of buying an environmentally friendly vehicle

Vehicle taxation in Nordic countries

Conventional vehicles

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
Gasoline/diesel vehicles							
Import taxes		€/g	%		%	€ per g/km (2012)	
CO2 0-50 grams/km	Registration tax: 105% of taxable value under 10266, 180% of taxable value over 10615	2,7	5,0	The duty consist of a fixed amount of € 6.706 + 100% of the part of the invoice amount exceeding 6.706 €, but not 20.161 +125% of the rest.	0	-111,5	No taxes for vehicles produced in Europe - 10 % import tax for vehicles outside EU.
CO2 51-80 grams/km		2,7	10,6		0	-98,4	
CO2 81-100 grams/km		2,7	14,9		10	-98,4	
CO2 101-115 grams/km		2,7	19,1		15	-98,4	
CO2 116-120 grams/km		2,7	20,1		15	98,4	
CO2 121-140 grams/km		27	23,8		20	98,4	
CO2 141-160 grams/km		40,4	27,7		25	99,1	
CO2 161-180 grams/km		40,4	31,6		35	99,1	
CO2 181-200 grams/km		53,8	35,1		45	231,2	
CO2 201-225 grams/km		53,8	39,1		55	231,2	
CO2 226-250 grams/km		53,8	42,4		60	231,2	
CO2 >250 grams/km		53,8	50,0		65	371	
VAT (%)	25	25	23	N.A.	25,5	25	0,25
Other import fees		(0-13.333€ - 50% (13.333 > 75% of invoice					

Taxation on environmentally friendly vehicles

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
Hybrid vehicles	Registration tax	N.A.	acc. CO ₂	N.A.	CO ₂ - tax	CO ₂ - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
Subsidy	N.A.	N.A.	N.A.	N.A.	N.A.	10% reduction in calculation weight	N.A.
Hybrid plug-in	Registration tax	N.A.	acc. CO ₂	N.A.	CO ₂ - tax	CO ₂ - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
Subsidy	N.A.	N.A.	N.A.	N.A.	CO ₂ levels below 50g/km € -7.500	10% reduction in calculation weight	N.A.
Battery vehicles	0	0	0% (CO ₂ =0 g/km)	Temporary zero	No CO ₂ tax	No CO ₂ tax	0
VAT	25%	Zero until 1.1.15	23	Temporary zero	25,5	0	25
Subsidy					-€ 10.000		
Hydrogen vehicles	0	0	0% (CO ₂ =0 g/km)	Temporary zero	No CO ₂ tax	No CO ₂ tax	0
VAT	25%	Zero until 1.1.15	23	Temporary zero	25	0	25
Subsidy					-€ 10.000		

Vehicle cost calculations

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
Gasoline							
Vehicle factory cost/inc. shipping	15.000	15.000	15.000	15.000	15.000	15.000	15.000
CO2 emission 119 g/km	-1.612	317	2.985	0	2.250	877	0
Vehicles weighing up to 900 kg:	0	0	0	879	0	4.312	0
Other import taxes	22.312	8.212	0	12.984	0	344	0
VAT	3.750	3.750	4.137	0	4.399	3.750	3.750
TOTAL	39.450	27.279	22.122	28.863	21.649	24.282	18.750
Battery							
Vehicle factory cost/inc. shipping	30.000	30.000	30.000	30.000	30.000	30.000	30.000
Other import taxes	0	0	1.500	0	0	0	0
VAT	7.500	7.500	7.245	0	0	0	7.500
TOTAL	37.500	37.500	38.745	30.000	30.000	30.000	37.500

Other incentives

- all listed in the project report









































- Many large cities offer free parking
- Infrastructure is though limited – Oslo (and/or Norway) is an exemption with more than 2.000 charging points compared to f.ex. 6 public charging polls in Reykjavík with free electricity

INTELECT calculators


- There are two different calculators now available. **Calculator A** calculates the total cost of ownership, taking the different depreciation into the account.
- With **calculator B** the user can compare different types of electric vehicles to most types of conventional vehicles. The user can play with parameters like energy prices, parking fees, battery leasing and oil changes in the assumptions and see how they affect the results.


Calculator B

- The purpose of the EV calculator is to make the cost comparison simpler and help the consumer to get a better picture of the various cost difference between conventional vehicles and EV's. The calculator does not give any final answer about the feasibility of EV's, but gives an insight into the competitiveness of EV's.
- The calculator also makes it possible for the user to play with different parameters to understand how they affect the comparison

 Price of Electricity	0,20   €/kWh 	 Price of Gasoline	1,70   €/ltr 
 Price of Diesel	1,50   €/ltr 	 Oil change	50   €/each 
 Battery rental	0   €/mth 	 Parking and road taxes	0   €/mth 
 Parking and road taxes	0   €/mth	 Additional consumption	0   % 
 Additional consumption	0   %	 Calculate for	1   year
 Annual Driving	20.000   km		

Select electric car type

Manufacturer **Citroen** 

Model **C-ZERO** 

Select Type

Engine	Transmission	kw
Electric	Auto (4)	47

Result for 1 year

Fuel Consumption **3.760** kWh

Fuel Cost **752** €


Emission CO2 **0** kg


Annual tax €

Purchase price €

Cost **0,03** €/km

Select type of car

Manufacturer **Citroen** 

Model **C1** 

Select Type

Engine	Transmission	cm3
Gas (4)	Stick (5)	998

Result for 1 year

Fuel Consumption **900** ltr

Fuel Cost **1.530** €

Emission CO2 **2.060** kg

Annual tax €

Purchase price €

Cost **0,08** €/km

Difference

Cost: **928** € Emission CO2: **2.060** kg

Running cost



Result for 1 year

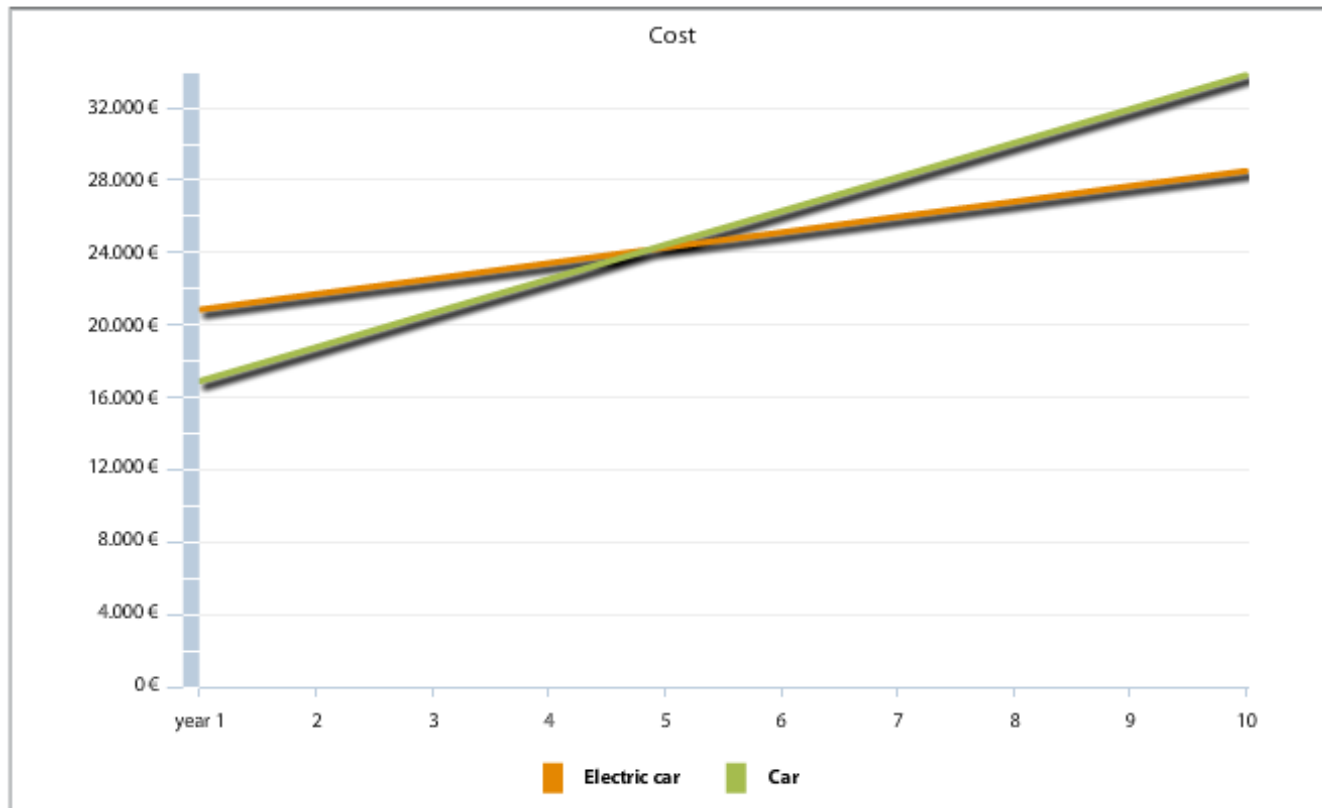
Fuel Consumption **3.760** kWh
Fuel Cost **752** €
Emission CO2 **0** kg
Annual tax €
Purchase price €
Cost **1,04** €/km

Result for 1 year

Fuel Consumption **900** ltr
Fuel Cost **1.530** €
Emission CO2 **2.060** kg
Annual tax €
Purchase price €
Cost **0,84** €/km

Difference

Cost: **1.028** € Emission CO2: **2.060** kg



Icelandic example

Icelandic example 1

- Two similar sized vehicles from the same producer. Battery v.s. gasoline



Niðurstaða fyrir 1 ár

Eldsneytiseyðsla **3.760** kWh

Eldsneytiskostnaður **45.120** kr

CO2 útblástur **0** kg

Bifreiðargjald **10.000** kr

Bílverð kr

Kostnaður **2,75** kr/km

Niðurstaða fyrir 1 ár

Eldsneytiseyðsla **900** ltr

Eldsneytiskostnaður **231.884** kr

CO2 útblástur **2.060** kg

Bifreiðargjald **10.000** kr

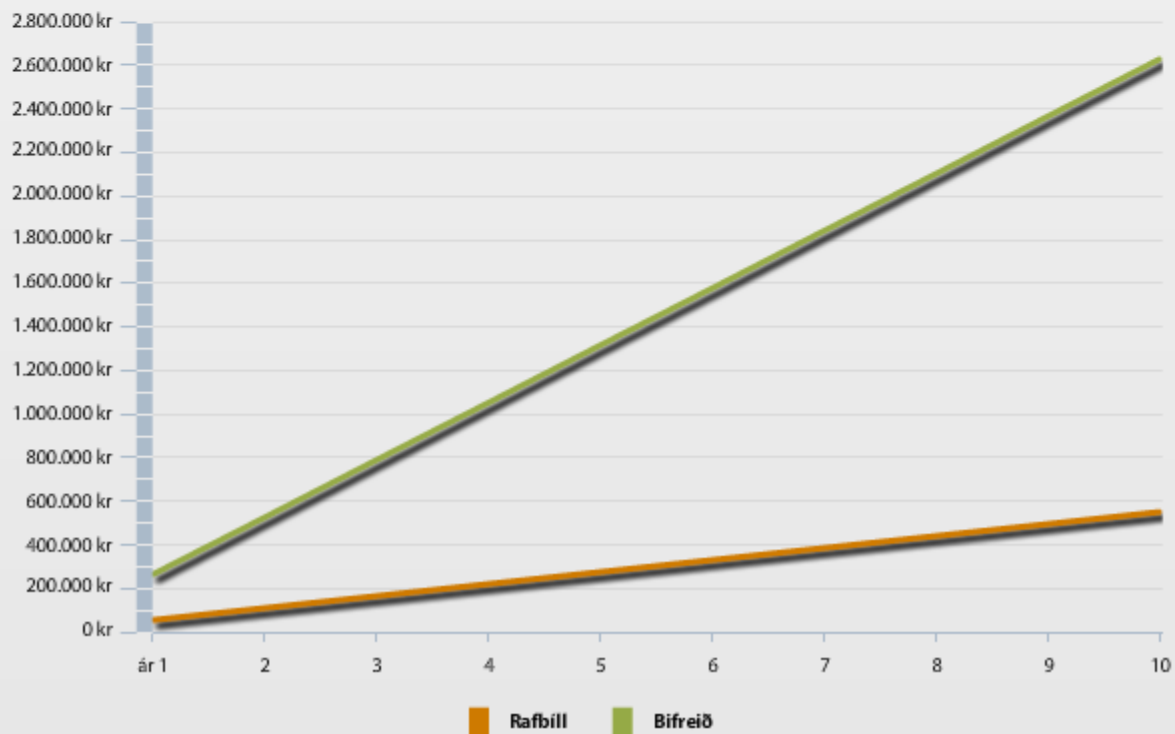
Bílverð kr

Kostnaður **13,14** kr/km

Mismunur

Kostnaður: **207.765** kr CO2 útblástur: **2.060** kg

Kostnaður á 10 árum



Niðurstaða fyrir 1 ár

Eldsneytiseyðsla	3.760	kWh
Eldsneytiskostnaður	45.120	kr
CO2 útblástur	0	kg
Bifreiðargjald	10.000	kr
Bílverð	4.000.000	kr
Kostnaður	202,75	kr/km

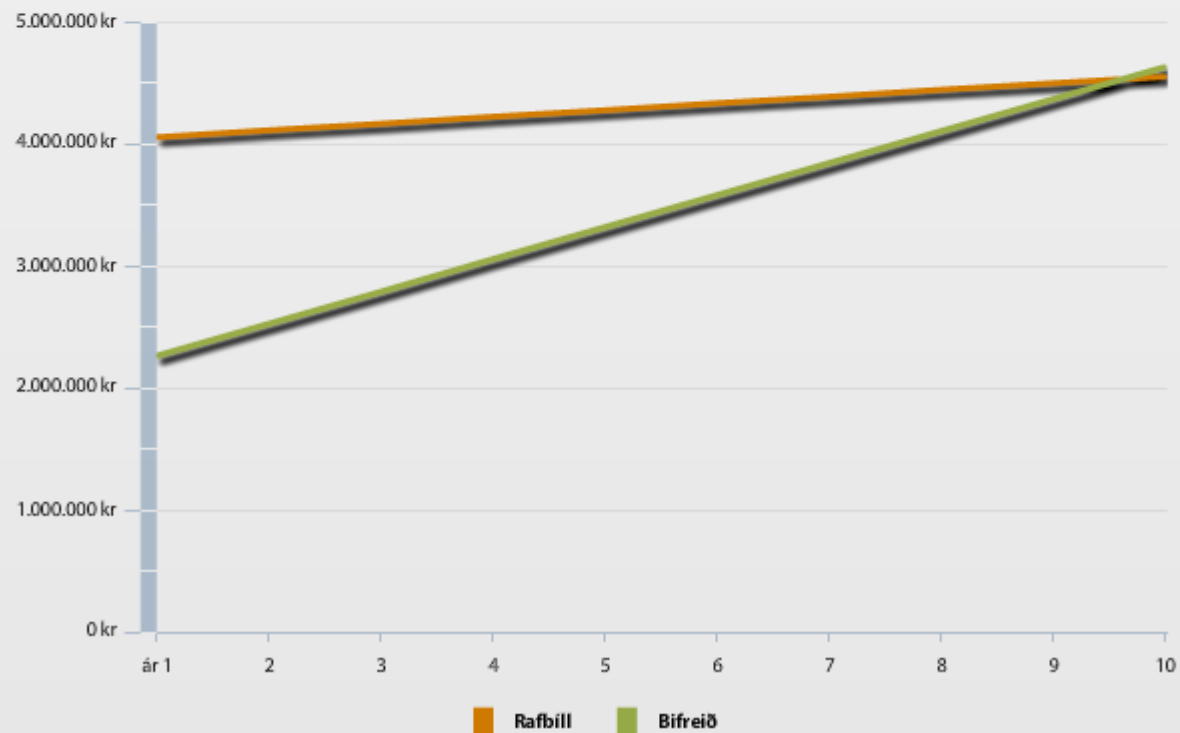
Niðurstaða fyrir 1 ár

Eldsneytiseyðsla	900	ltr
Eldsneytiskostnaður	231.884	kr
CO2 útblástur	2.060	kg
Bifreiðargjald	10.000	kr
Bílverð	2.000.000	kr
Kostnaður	113,14	kr/km

Mismunur

Kostnaður: **207.765** kr CO2 útblástur: **2.060** kg

Kostnaður á 10 árum



Icelandic example 2

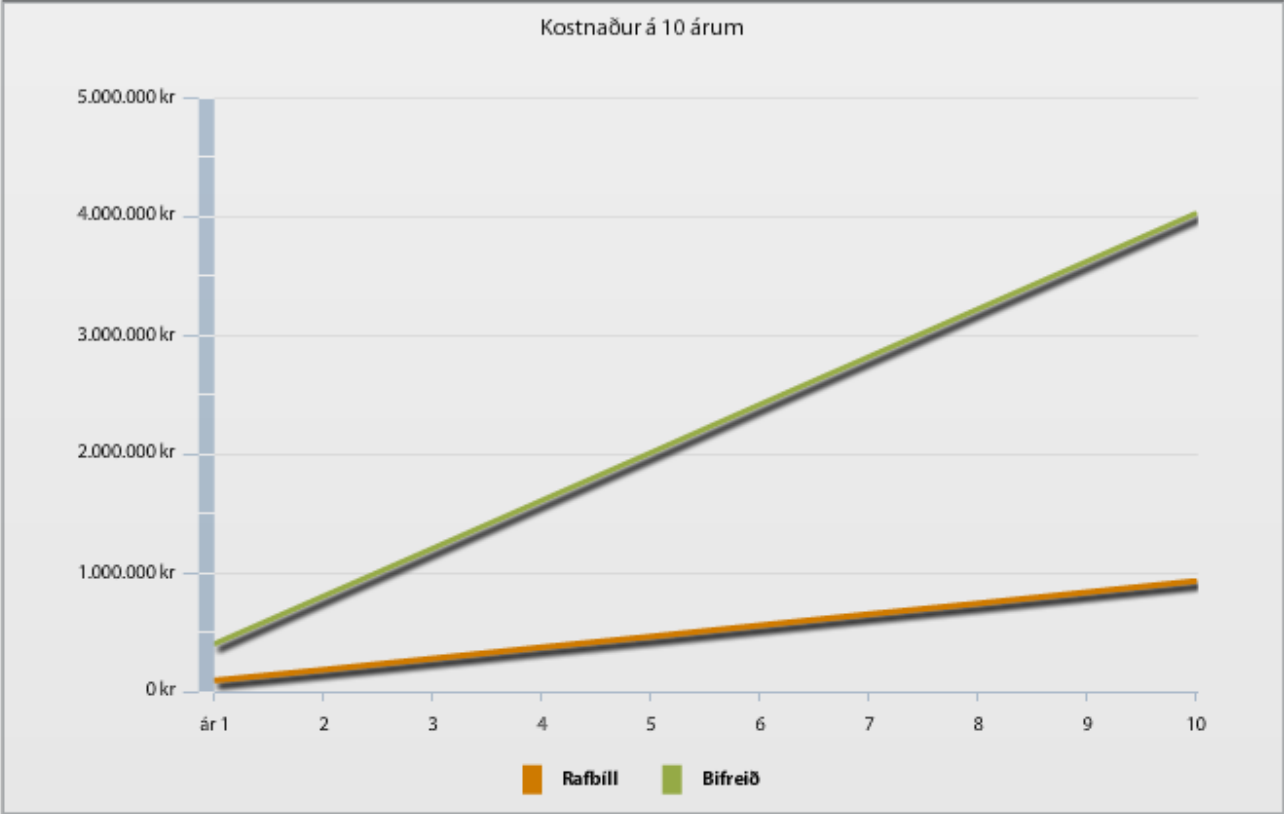
- Two similar sized vehicles from the same producer. Plug in hybrid v.s. gasoline



0%20%40%60%80%100%

Eldsneytiseyðsla	2.128 kWh		198 ltr	Eldsneytiseyðsla	1.400 ltr	
Eldsneytiskostnaður	25.536 kr		51.014 kr	Eldsneytiskostnaður	360.709 kr	
CO2 útblástur	246 kg			CO2 útblástur	3.280 kg	
Bifreiðargjald	10.000 kr			Bifreiðargjald	20.320 kr	
Bílverð	<input type="text"/>	kr		Bílverð	<input type="text"/>	kr
Kostnaður	4,64 kr/km			Kostnaður	20,10 kr/km	

Mismunur	
Kostnaður:	309.179 kr
CO2 útblástur:	3.034 kg



0% 20% 40% 60% 80% 100%

Eldsneytiseyðsla **2.128** kWh | **198** ltr

Eldsneytiskostnaður **25.536** kr | **51.014** kr

CO2 útblástur **246** kg

Bifreiðargjald **10.000** kr

Bíilverð **5.790.000** kr

Kostnaður **294,14** kr/km

Eldsneytiseyðsla **1.400** ltr

Eldsneytiskostnaður **360.709** kr

CO2 útblástur **3.280** kg

Bifreiðargjald **20.320** kr

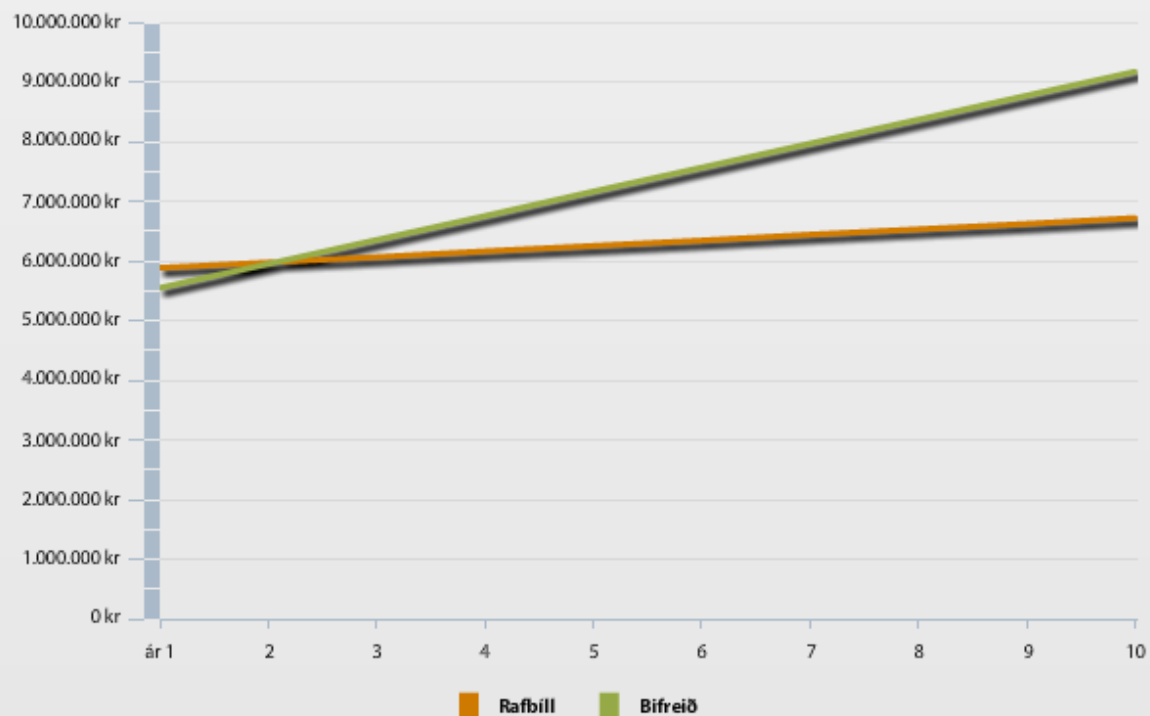
Bíilverð **5.150.000** kr

Kostnaður **277,60** kr/km

Mismunur

Kostnaður: **309.179** kr CO2 útblástur: **3.034** kg

Kostnaður á 10 árum



Iceland

- The calculator indicates that incentives for small battery vehicle in Iceland are not enough when compared to a small efficient gasoline vehicle. (*small or no difference in import tax and annual tax*)
- Incentives for medium sized plug in vehicle in Iceland are possibly enough when compared to a medium sized gasoline vehicle

We have to push the clean vehicles into the market

- 1000 € 100 €



Thank you!

During this lecture the CO₂ emission
from the use of fossil fuel in transport in
Iceland was **87.356 kg**

www.orkusetur.is/intelect



Orkusetur
www.orkusetur.is