



norden

Energy & Transport

# **INTELLECT – End of Project Report**

Activities and outcomes of the INTELLECT project



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Keywords: Electric transportation;  
government incentives;  
vehicle taxation;  
environmentally friendly fuels

**Date: 20.07.2012**

**Abstract:**

The objective of the project is to map available incentives in all of the Nordic countries, including Greenland and Faroe Islands. The project did not only map the national incentives but also looked into specific city incentives. The other main task was to build online calculators using all the collected data so that users can actually see how incentives affect the total cost of ownership (TCO) and in that sense help customers to take investment decisions. This calculator is available in all languages and is the key outcome of this project [www.orkusetur.is/intelect](http://www.orkusetur.is/intelect) . The outcome of the project is a support tool for all interest groups which are working in the field of environmental fuels. It is also a useful tool for vehicle manufacturers to see how aggressive most of the Nordic nations have been in providing incentives for environmentally friendly vehicles.

Most of the information from the project are listed in this report however the key findings and the key outcome is only available online (see above link).

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## Executive Summary

The Nordic governments have sometimes stated that the goal is to create the “Green Valley of the North” in the Nordic countries. All of them have set out strong environmental policies aiming to reduce green house gas emissions and become more environmentally friendly.

With regards to this, most of them have set forward ambitious goals regarding reducing the use of fossil fuels in transport. Most of the governments have now put in place different incentives to stimulate the growth of environmentally friendly vehicles in the respective countries. Norway, Denmark and Iceland have been the most aggressive in this field and environmentally friendly vehicles now get large discounts or free entry into these countries. Norway is leading the way with no taxes on zero emission vehicles and Iceland with very similar policy. This can be a very useful tool as Norway boasts now the largest fleet of electric vehicles proportionally. Taxes on cars are very high in these countries and while the zero emission vehicles are still more expensive than conventional vehicles on the market these incentives make the TCO close to being the same between new fuel vehicles and the ones powered by fossil fuel.

This project has mapped all these incentives which are now, for the first time, all collected in one document. However the main dissemination for the project is web-based as the project has collected data for creating user-friendly calculators for easy cost comparison between different types of vehicles, i.e. different fuelled vehicles and different types. This tool can also be used by decision makers interested in understanding the benefits of providing incentives for such vehicles. All figures and documentation of the project along with the calculators can be found at [www.orkusetur.is/intelect](http://www.orkusetur.is/intelect) in all the Nordic languages.

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# 1 Introduction

The market introduction of alternative vehicles; low emission vehicles and/or vehicles fuelled on fuels other than conventional fossil fuels, has come a rather long way in the Nordic countries; Norway, Denmark (and Greenland), the Faroe Islands, Iceland, Sweden, and Finland. In these countries policies have already been formed towards increasing the use of alternative vehicles – specifically low emission vehicles. Some of these countries also have a special policy for zero emission vehicles.

Most of the Nordic countries have also decided to provide incentives to further promote the use of such vehicles. However, it is not easy as a vehicle purchaser to grasp all the incentive options available; thus hampering the further development of the market introduction of alternative vehicles. It appears to be difficult both for the general public and local/regional/national policy makers to achieve a full overview of all incentives available; in their own countries as well as in all the Nordic countries. Also, at the moment of vehicle purchase, it often seems to be quite difficult for the general public and/or companies to comprehend the real purpose and financial effect of the incentives. It requires some extra level of effort to acquire the background information of the incentives; many tend to skip this effort as it may appear too complex and/or time consuming. Furthermore, in this context it would be very beneficial to have an overview of non-financial incentives, e.g. the permission of driving on otherwise designated bus lanes. In this case, the non-financial incentives are not always implemented on a national level. In fact, it is not uncommon that different cities provide city-specific incentives.

There is evidently a difference of how the market has reacted to these incentives. For instance, from the market responses, Norway has been able to kick-start the battery vehicle market faster than the other Nordic nations. As the effect of incentives differs (some incentives are working very well, others are not), there is a large potential for e.g. policy makers to have an overview of which incentives are in place and where.

This report maps all current incentives in the Nordic countries and compares different costs of buying/using alternative vehicles. In conjunction to mapping different incentives, the project also constructed online calculators which are the key tools of comparing different costs. These calculators, together with an overview of incentives, are available at [www.orkusetur.is/intelect](http://www.orkusetur.is/intelect). The calculators are tools but naturally have limitations as they will not reveal all the issues related to the alternative vehicles. It is difficult to compare all cost related to the vehicle during the life of the vehicle; e.g. the life span of batteries compared to that of combustion engines, the re-sale price of the vehicle (the battery vehicle market is still immature) and other issues. However, the calculator is a good indicator of the Total Cost of Ownership (TCO) and is a very helpful tool for the consumer as it highlights the CAPEX (actual cost for buying) and OPEX (actual cost of ownership) of an alternative vehicle.

The project has also briefly analyzed different regulations with the aim to identify if any are in place which might be a barrier for introducing some of the future technologies for alternative fuelled vehicles.

## 2 Method and implementation

### 2.1 Taxation

It is evident that the Nordic countries are not all following the same pathway when it comes to taxation of vehicles. Understandably there is a difference between car producing countries, like Sweden, and the other countries. Another key difference is also available local resources. There is a higher interest for battery and hydrogen vehicles in countries which have a large source of renewable electric power like Iceland and Norway but higher for bio-fuels in countries like Sweden and Finland that have large bio resources. Still, in most of the Nordic states taxation on fuel and vehicles are a vital income source for their governments. When providing incentives such high taxation can though make things simpler. Revoking taxes (specifically temporarily) is usually a simpler process for governments than providing direct funding or subsidies. Therefore, it is "easier" (that is provides less financial risk) to reduce taxation and, in that way, reduce the cost difference between conventional technologies and new (developing) technologies.

Taxation of fuels and vehicles in the Nordic countries is not simple and not harmonized in the Nordic countries. Here below is a table showing the basic taxation of vehicles in the Nordic countries for conventional vehicle and for alternatives. It includes many different variables and shows the difference between the taxation in the countries. Most of the Nordic countries base their taxation on CO<sub>2</sub> emission from the vehicles, but are not using the same breakdown into categories (which makes the table here below a bit more confusing). The table also includes the different tax systems for alternative fuelled vehicles and zero emission vehicles. Many of the countries have put in place specific tax systems (many temporary) for such vehicles to make such vehicles more cost competitive and more attractive to the customer.

For Sweden there are a couple of special incentives in place.

For electric vehicles - Procurement of electric vehicle incl. investment support of

- 25% of additional cost maximum of 100 000 SEK for the first sold 75 vehicles
- 25% of additional cost maximum of 50 000 SEK for 1000 sold vehicles

Other incentives for alternative vehicles, except ethanol vehicles, exist in Sweden. Fringe benefits, maximum reduction of taxable value of the vehicles of 16 000 SEK per year, and a "super bonus" for low emitting vehicles (in force in January 2012) with investment support up to 40 000 SEK. There is a limited amount of vehicles for the super bonus; 5000 vehicles are supported.

As mentioned earlier there is a large difference in the taxation of conventional vehicles. While some countries use a fixed percentage based on CO<sub>2</sub> emissions, other countries base the tax purely on the cost of the vehicles; i.e. more costly vehicles have higher taxes. An example of a positive move towards using lower emission vehicles was made in Iceland in 2011 when the government changed the taxation policy from fixed import duties depending on engine size to taxing vehicles depending on CO<sub>2</sub> output (see table 1). This meant that vehicles with low emissions became cheaper than before changing the consumer attitude towards alternative vehicles in a positive way. Specifically, this policy change had an impact on fleet operators such as car rental companies who now bought vehicles with low CO<sub>2</sub> emissions in much larger quantities leading to reduced overall consumption of conventional fuels. Such CO<sub>2</sub> emission focused actions (already in place in many of the other Nordic countries) can have a large impact in the direction that the conventional vehicle fleet will consume less fossil fuel. For instance, in Finland the taxation was revised in the beginning of 2008, and became proportioned to CO<sub>2</sub> emissions level. Since then, the annual average CO<sub>2</sub> emissions of all cars sold has continuously lowered from 180 g/km in 2007 to about 145 g/km in 2011. By having different taxation schemes for alternative fuels, the TOC for vehicles may drastically change and in that sense increases the market share (table of taxation on fuels, see Annex I and [www.orkusetur.is/intelect](http://www.orkusetur.is/intelect)).

However, when it comes to alternative vehicles the picture changes somewhat; already some of the countries have implemented reduced taxes, specifically for zero emission vehicles (ZEV) (battery and hydrogen). Norway has also some incentives towards hybrid and plug-in vehicles. Norway has actually the most incentives already in place and in chapter 4.1 the Norwegian case will be explored specifically as their national incentives seem to have kick-started the market, something that seems to be happening very slowly in the other countries.

Table 1. Taxation of vehicles in the Nordic countries<sup>1</sup>.

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
<b>Gasoline/diesel vehicles</b>							
Import taxes		dkr/g	%		%	NOK per g/km (2012)	
CO2 0-50 grams/km	Registration tax: 105% of taxable value under 10266, 180% of taxable value over 10615	20	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	-850	No taxes for vehicles produced in Europe - 10 % import tax for vehicles outside EU.
CO2 51-80 grams/km		20	10,6		0	-750	
CO2 81-100 grams/km		20	14,9		10	-750	
CO2 101-115 grams/km		20	19,1		15	-750	
CO2 116-120 grams/km		20	20,1		15	750	
CO2 121-140 grams/km		200	23,8		20	750	
CO2 141-160 grams/km		300	27,7		25	756	
CO2 161-180 grams/km		300	31,6		35	756	
CO2 181-200 grams/km		400	35,1		45	1763	
CO2 201-225 grams/km		400	39,1		55	1763	
CO2 226-250 grams/km		400	42,4		60	1763	
CO2 >250 grams/km		400	50,0	65	2829		
VAT	25%	25%	23	N.A.	25,5	25%	25%
Other import fees		(0-13.333€ - 50% (13.333 > 75% of invoice value					
<b>Bio methane gas vehicles</b>	Registration tax	N.A.		N.A.	CO2 - tax	CO2 - tax	0
VAT	25%	N.A.	acc. CO <sub>2</sub>	N.A.	25,5	25	25
Subsidy	N.A.	N.A.	0	N.A.	€ 7.600	N.A.	N.A.
<b>Natural gas vehicles</b>	Registration tax	N.A.	acc. CO <sub>2</sub>	N.A.	CO2-tax	CO2 - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
<b>Ethanol vehicles</b>	Registration tax	N.A.	acc. CO <sub>2</sub>	N.A.	CO2 - tax	CO2 - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
<b>Hybrid vehicles</b>	Registration tax	N.A.	acc. CO <sub>2</sub>	N.A.	CO2 - tax	CO2 - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
Subsidy	N.A.	N.A.	0	N.A.	N.A.	10% reduction in calculation weight	N.A.
<b>Hybrid plug-in</b>	Registration tax	N.A.	acc. CO <sub>2</sub>	N.A.	CO2 - tax	CO2 - tax	0
VAT	25%	N.A.	23	N.A.	25,5	25	25
Subsidy	N.A.	N.A.	0	N.A.	CO2 levels below 50g/km € -7.500	10% reduction in calculation weight	N.A.
<b>Battery vehicles</b>	0	0	5% (CO <sub>2</sub> =0 g/km)	Temporary zero	No CO2 tax	No CO2 tax	0
VAT	25%	Zero until 1.1.15	23	Temporary zero	25,5	0	25
Subsidy					-€ 10.000		
<b>Hydrogen vehicles</b>	0	0	5% (CO <sub>2</sub> =0 g/km)	Temporary zero	No CO2 tax	No CO2 tax	0
VAT	25%	Zero until 1.1.15	23	Temporary zero	25	0	25
Subsidy					-€ 10.000		

When using these cost calculations to see what incentives mean in terms of cost for vehicles table 2 shows few examples for costs of cars<sup>2</sup>.

<sup>1</sup> It should be noted that some of the incentives in this table are not permanent. An example of this is that the registration tax for battery and hydrogen vehicles is zero until 2015 – except if further changes will be made.

Table 2. Cost comparison of different fuelled type vehicles. Note the table is not a direct comparison between same type of vehicles but only shows how the calculations for final price is for different vehicle categories (more detailed examples can be found in Annex II)

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
<b>Gasoline</b>							
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission 159 g/km	269	1.613	5.775	0	5.250	4.791	0
Vehicles from 901 kg to 1.500 kg:	0	0	0	1.348	0	10.209	0
Other import taxes	35.814	12.730	0	18.984	0	584	0
VAT	5.250	5.250	6.158	0	6.694	5.250	5.250
<b>TOTAL</b>	<b>62.333</b>	<b>40.593</b>	<b>32.933</b>	<b>41.332</b>	<b>32.944</b>	<b>41.835</b>	<b>26.250</b>
<b>Diesel</b>							
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission 159 g/km	537	1.613	5.775	0	5.250	4.791	0
Vehicles from 901 kg to 1.500 kg:	0	0	0	1.348	0	10.209	0
Other import taxes	35.814	12.730	0	18.984	0	610	0
VAT	5.250	5.250	6.158	0	6.694	5.250	5.250
<b>TOTAL</b>	<b>62.602</b>	<b>40.593</b>	<b>32.933</b>	<b>41.332</b>	<b>32.944</b>	<b>41.861</b>	<b>26.250</b>
<b>Methane/Natural gas</b>							
	As diesel						
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission 159 g/km		1.613	5.775		5.250	4.791	0
Other import taxes			0		0	10.209	0
VAT			6.158		6.694	584	5.250
Subsidy			0		-5.250	5.250	0
<b>TOTAL</b>	<b>N/A</b>	<b>N/A</b>	<b>32.933</b>	<b>N.A.</b>	<b>27.694</b>	<b>41.835</b>	<b>26.250</b>
<b>Battery</b>							
Vehicle factory cost/inc. shipping	35.000	35.000	35.000	35.000	35.000	35.000	35.000
Other import taxes	0	0	1.750	0	0	0	0
VAT	8.750	8.750	8.453	0	0	0	8.750
<b>TOTAL</b>	<b>43.750</b>	<b>43.750</b>	<b>45.203</b>	<b>35.000</b>	<b>35.000</b>	<b>35.000</b>	<b>43.750</b>
<b>Hydrogen</b>							
Vehicle factory cost/inc. shipping	50.000	50.000	50.000	50.000	50.000	50.000	50.000
Other import taxes	0	0	2.500	0	0	0	0
VAT	12.500	12.500	12.075	0	2.750	0	12.500
<b>TOTAL</b>	<b>62.500</b>	<b>62.500</b>	<b>64.575</b>	<b>50.000</b>	<b>52.750</b>	<b>50.000</b>	<b>62.500</b>

It's apparent when looking at table 2 that incentives can have a large impact on ZEV's. This is specifically the case for Norway, Denmark and Greenland as well as for hydrogen vehicles in Iceland. For example a € 27.000 gasoline vehicle is much more expensive (purchasing cost) for the consumer than a € 40.000-60.000 battery or hydrogen vehicle. Comparing purchasing prices of alternative vehicles does though not tell the full story about TCO, specifically if nations use incentives for fuels to get them to the market and therefore there can be a large difference between purchasing cost and TCO.

Operational costs are therefore different as conventional fuel is heavily taxed in the Nordic countries. In annex I (and at [www.orkusetur.is/intelect](http://www.orkusetur.is/intelect)) an overview can be found over all taxation on fuels in the Nordic countries. Most of the countries have a taxation of roughly € 0,4-0,6 per/l for conventional fuel (less for diesel though). However, alternative fuels carry much lower taxation. Taxation on fuel is a vital income for Nordic governments as the tax is e.g. used for maintaining and upgrading the transportation network as well as to reduce consumption (environmental tax). However at the moment, fuels that do not have tailpipe

<sup>2</sup> The calculators made in this project will give a much more detailed overview of such costs ([www.orkusetur.is/intelect](http://www.orkusetur.is/intelect)).

emission carry little or no tax. This is very important while the new technology is maturing and the vehicles are still more expensive. Still some governments have expressed concerns regarding how to implement tax on 'alternative'-fuels in the future specifically if the vehicle can be "fuelled" everywhere, i.e. home refueling of electric vehicles.

The lower cost of some of the alternative fuels means that the daily operational cost of alternative vehicles becomes cheaper than of conventional vehicles. Still the TCO for alternative vehicles is in most cases still higher than of conventional fuelled vehicles as the vehicles still have a much higher purchasing cost – despite the incentives.

## 2.2 Other incentives – indirect financial and non-financial incentives

Most of the Nordic countries have provided other incentives than changing direct taxation. These incentives are often at a municipal level and or cooperation between municipal and national governments, such as free road tolls, driving on bus lanes etc. There is a difference between the countries in this sense. Norway has taken the largest step in this direction providing the largest impact (for details, please see chapter 4.1). Below are the key non-financial (or indirect) incentives in the Nordic countries listed (valid during the course of the project; January 2011-2012):

### Denmark:

- Public charging stations with free electricity in some municipalities
- Free parking for EV's<sup>3</sup>

### Faroe Island:

- None

### Finland:

- The City of Helsinki grants 50% reduction for parking fees for low emission cars
- Some free charging stations for EV's in Helsinki and Espoo (supported by energy companies)

### Greenland<sup>4</sup>

- None

### Iceland – municipal incentives (incentives only available in Reykjavik):

- Free 90 minute parking in Reykjavik (parking is not charged in any other city)
- 6 charging polls (free electricity) – space not reserved for battery vehicles

### Norway:

- Free parking in publicly owned parking spaces
- No road toll
- Access to bus lanes
- Free admission on national road ferries for the car (not the driver)
- Increased mileage allowance in public sector (NOK 4 / km instead of NOK 3.50 / km)
- 50% taxable benefit if used as a company car

### Sweden:

#### Stockholm:

- For alternative vehicles registered before 2008 - Congestion tax exemption (max 60 SEK per day)
- For electric or plug-in vehicles - Free charging at about 70 sites

<sup>3</sup> Municipalities have previously been able to offer parking free of charge for drivers of EVs parking free of charge. But it turned out that the legislative framework didn't allow it. This is expected to be changed in Q1 of 2012 as a consequence of a legislative review

<sup>4</sup> In Greenland there are in a sense negative incentives. There is almost no taxation on fossil fuel, 1 l. gasolin = € 0,74. There is a very high tax on hydrogen € 14,80 per/m<sup>3</sup>.

- For electric or plug-in vehicles - Free parking at Arlanda (about 80 SEK/h)

*Gothenburg:*

- Free parking in certain areas

Many of these incentives can be of high value for the customer. Incentives leading to time saving, e.g. driving on bus lanes, priority down- town parking (free) could offset the extra vehicle cost. Non-financial incentives can therefore be of higher value than financial incentives but so that such incentives become effective it is important to have good cooperation between municipal and national government as some of the incentives touch on both authorities.

### **3 Regulatory barriers in the Nordic countries**

In principal, the Nordic countries follow common European regulations when it comes to certification (homologation) of vehicles. In general there are no regulatory barriers when it comes to alternative vehicles and the Nordic countries have been relatively open towards testing new technologies. All of the Nordic states are willing to promote alternatives and politicians have been pushing statements as "Nordic countries – green valley of Europe". This "green" thinking within Nordic governments seems to spread through the regulatory system as no preventative regulation has been implemented.

Many vehicle manufacturers have actually stated that entering with new "technology" vehicles is actually easier in the Nordic countries than elsewhere. A good example of this has been the case for hydrogen vehicles in Iceland, Denmark and Norway where vehicles from USA, Asia and Europe have been registered without any major issues (given that adequate national certificates are presented). Iceland of course has the special advantage of allowing both USA certificated vehicles and European certificated on the roads of the country but as a rule the other Nordic nations only allow European certificated vehicles to operate. In some cases registering a non-EU vehicle might be possible, but with high extra costs.

One concern is retrofitted vehicles. A number of players are already retrofitting vehicles, i.e. non-OEM (Original Equipment Manufacturer) built vehicles, and such vehicles usually do not have the same homologation requirements as OEM built cars. Since these vehicles are usually built in small quantities, they are usually exempted from the full certification procedure, and are allowed to be operated in Nordic countries. However, if proper certification cannot be provided, there are restrictions in some of the Nordic countries regarding the registration of such vehicles. In Norway, it has a challenge in registering such vehicles. But this is not the case everywhere as, e.g. in Iceland most of the bio-methane fleet is locally retrofitted and the same applies to part of the small battery fleet vehicles.

Although safety issues have the highest priority in all uses of vehicles, the bureaucracy in the Nordic countries is probably less complicated than in larger countries. The positive attitude towards using renewable fuel also plays an important role and the general joint Nordic governmental green vision for the countries most definitely helps. Therefore in many cases it has been simpler for the large OEM's to demonstrate technology in the Nordic countries than elsewhere in Europe.

## 4 Environmentally friendly vehicles in the Nordic countries

The Nordic countries have been working towards increasing the number of environmentally friendly vehicles over the last few years. In general it has been a success story. The number of environmentally friendly vehicles has increased faster in many of the Nordic countries than in other countries around the globe. The table here below shows these numbers.

Table 3. Number of environmentally friendly vehicles in the Nordic countries.

Country	EV's	Hydrogen	Other alternative	Total cars
Faroe Islands	3	0	0	27.253
Greenland	5	0	0	2.500
Iceland	6	12	630	226.289
Denmark	904	14	56	2.195.127
Finland	< 100	0	< 1000 NG	4.377.983
			< 5000 FFV/E85	
Norway	5.500	30	13.772	2.827.549
Sweden	300	0	465443	4.408.749

NB. The table includes personal vehicles and delivery vehicles.

Looking at the numbers the success of Sweden in alternatives (specifically ethanol) and Norway particularly in EV's stand out. In both cases incentives or regulations played an important role, which implies that by putting incentives in place it is possible to speed up the market introduction of certain vehicles. For the purpose of this project it therefore fits well to look deeper into the Norwegian case.

### 4.1 Norwegian EV incentives – a success story

Norway introduced its current EV incentive scheme gradually during the late 1990's and early 2000. Core to the success of the incentive scheme, detailed earlier in this report, is to bring EV's up to or beyond par (TCO) with similar conventional (ICE) vehicles in Norway, both from an economical and a functional point of view.

Central to understanding the Norwegian EV incentive model is the fact that regular ICE cars are taxed heavily in Norway. Upon import, cars are taxed according to their weight, CO<sub>2</sub> emissions and motor effect – as well as NO<sub>x</sub> emissions (starting 2012). On top of this, cars are taxed with 25% VAT.

EVs and fuel cell electric vehicles, FCEVs, are completely exempt from import tax and VAT. In addition, EV operating costs are significantly lower than for a similar ICE vehicle. The result is that the TCO for EVs compares favorably with ICE cars, even more so with increased yearly driving distance.

Furthermore, several usage incentives have accelerated EV sales in and around urban areas. Central to these usage incentives is the decision to let EV's and FCEV's utilize excess capacity in bus-lanes. Especially along certain corridors, this incentive saves EV commuters significant amounts of time, while reducing noise

and local pollution to the benefit of everyone. Additionally, this incentive has no direct economic cost for the municipality. Another important usage-related incentive is access to free parking in all publicly owned parking spaces, as well as a significant number of reserved EV-parking spaces. Furthermore, the Government granted around €6,5 million in 2009 to accelerate the construction of charging points. Due to a "low tech, low cost" – approach, this grant money resulted in close to 2.000 new charging posts across Norway. As of January 2012, there are around 3.200 charging points in Norway

This highly consumer-centric approach has led to a rapidly growing market for EVs in Norway<sup>5</sup>, driven mainly by private demand. Until recently, one of the main barriers in the market was supply-side issues: The demand was there, but a small number of producers and importers meant limited choice and distribution. However, with the introduction of EV's such as Mitsubishi i-MiEV, Citroën C-ZERO, Peugeot iOn and Nissan LEAF in 2011, the incentive scheme started to display its true potential offering cars at a cost competitive level. A total of 2.240 EV's were sold in Norway in 2011, leading to a total of around 5.500 EV's on Norwegian roads by year-end.

Another benefit of the incentive scheme design is that all suppliers compete on identical terms according to normal, commercial rules. As a result, increased competition and higher market volumes have led to lower pricing. As of January 2012, the three quasi-identical cars iOn, C-ZERO and i-MiEV all cost around € 24.000, down from around € 30.000 on introduction a year earlier.

## 5 Web-based calculators for total cost of ownership and for capex and opex comparisons

The goal is create a tool to help the consumer taking the first step towards evaluating the cost elements of shifting from a conventional vehicle to an environmentally friendly vehicle. The goal is to keep the calculator alive over the next few years by regularly updating the calculator with new vehicles, changes in taxation of fuel or vehicles, etc. It should therefore help future customers to take the first step towards a more environmentally friendly transport.

It is not simple to build a calculator for a new technology. Specifically when the market entry has just started and it is difficult to evaluate some cost parameters such as depreciation of the vehicles, lifetime and possible resale value of the vehicles in a few years.

In the end, it was decided to deliver two calculators. One, **calculator A** (see figure 1) on the web page ([www.orkusetur.is/intelect](http://www.orkusetur.is/intelect)) that uses information from the Norwegian market which is the most advanced market in the Nordic countries. It provides the best estimates of depreciation over time by using know-how gathered in the Norwegian market. It is a simple calculator which gives a rough estimate of the TCO for different types of vehicles, depending on only key relevant issues. It is a good tool to get a quick overview and also gives a comparison to vehicles powered with other types of fuel. It should be noted that this simplified calculator is only provided in English, while the other is in all Nordic languages. **Calculator B** is different. It compares the operating and acquisition costs to those of regular cars. There are many parameters affecting the cost difference. Not only are EV's much more energy efficient than gasoline or diesel cars, but the price of electricity is very different from the price of petroleum. Since EV's use is promoted and subsidized in various ways, it's not always easy for the consumer to determine how advantageous switching to an EV is, or if there is any benefit at all. 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

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<sup>5</sup> For a full overview of Norwegian EV sales and customers demographics, please visit <http://gronnbil.no/elbiluniverset/kart.php>

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. It is though not possible to compare all issues of cost as analysis of lifetime are complicated, e.g. lifetime of batteries compared to combustion engines and the resale price is complicated to analyze. The battery vehicle market is still young and immature and in general the EV's market took off in the last couple of years. The lifetime is therefore yet to be seen. Currently the conventional combustion engine has a lifetime of >5.500 hours in general, which typically is a usage over >10 years. The re-sale market and lifetime of battery vehicles will therefore not fully be explored until after 5-10 years. In this project it was therefore decided not to make forecasts regarding this as any such attempts can easily be criticized and it would be difficult to justify (this is though addressed differently in calculator A, as described earlier).

However the calculator is a good indicator of the total cost and is a very helpful tool for the consumer to highlight what the actual cost for buying and owning an alternative vehicle is.

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. Fuel consumption data is taken from the European Driving Cycle (EDC) tests and the overall fuel consumption numbers are used. The calculator has the option to change the consumption based on personalized driving and environmental effect on fuel economy. Fuel consumption varies, depending on driving habits and environmental factors. Usually the standardized fuel consumption figures are lower than driver's experience. The EV's calculator offers the option of increasing the fuel consumption depending on the user's estimation or outcome from research projects. In the case of EV's the fuel consumption differs from the data from the EDC, i.e. specifically in cold climates. Some research shows that the range is only 50% of the EDC data. However with improved batteries and management systems this is improving as the vehicles mature. Plug-in hybrids (battery and gasoline) can either drive on pure electricity, purely on fuel or a combination of both. The EV's calculator offers users the option of evaluating the ratio of electricity use vs. fossil fuel use. This can be very different between users and also user's behaviour and environment. For example the access to plugs can have a major impact, for example weather the user has access to a charging post at the workplace, etc.

Due to different circumstances in different settings and countries, the original cost has to be entered manually to the calculators. The user adds the car price and annual taxes which is an open field, making it possible to enter the car price, complete with all subsidies, cost of capital and related financial costs. This makes the calculator flexible for different vehicles, tax changes, market circumstances, etc.

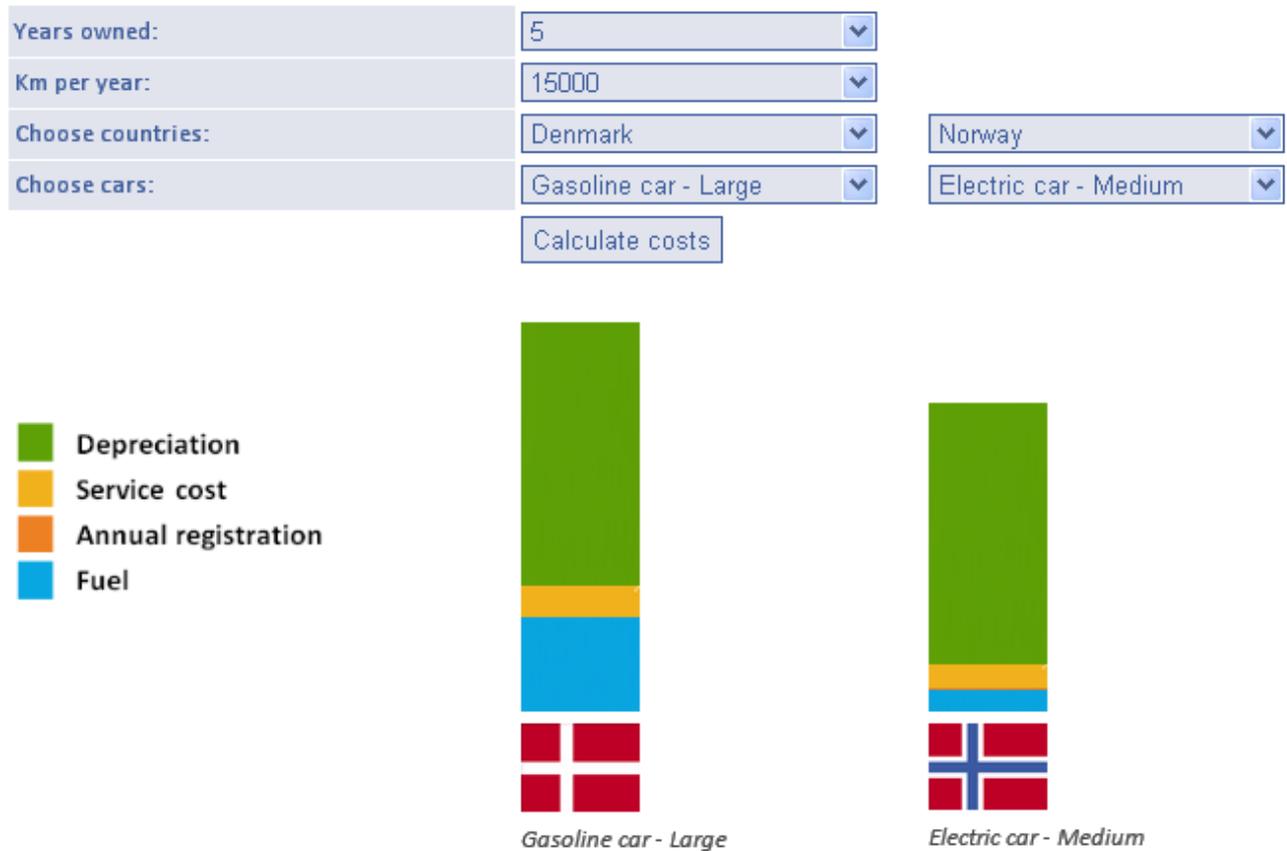


Figure 1: Screen shot from calculator A which displays graphically the advantage of buying an Electric vehicle in Norway compared to a conventional gasoline car in Denmark.

## 6 Conclusions

At the onset of the project, the goal was „[...] to map available incentives in all of the Nordic countries, including Greenland and Faroe Islands. [...] After collecting all available incentives in each location the information will be fed into a calculator which the project will build“.

As can be seen from this report along with the project web site this is all now delivered and available. Actually the calculators are two as the larger calculator does not include TCO but the other does. The reason is that the TCO is a relatively complex and debated topic as described in chapter 5.

The findings of the project can be used in all different segments of the society. The public can use the calculators in order to get an insight into the difference of cost by shifting from conventional vehicles to electric or other environmentally friendly fuels. In the same manner companies and/or institutions can evaluate the implications of shifting to an environmentally friendly fuel.

Regarding policy makers the project gives an overview of what all Nordic governments have initiated to stimulate the sales of electric/environmentally friendly vehicles. It is evident that the strong Norwegian incentives has had a drastic impact on the EV-market. No other country has the same share of battery electric vehicles as Norway. So if there is a strong interest to support the market then it can be done by

providing aggressive incentives. This report shows an overview of different taxes on conventional vehicles and fuels and also on „newenergy“ vehicles. In Annex II there is a table showing how taxes affect the pricing of vehicles and compares different type of vehicles. It should be noted in that table that the cost of a car is not a fixed model – rather assumed figure, but the goal is to show how taxes and/or incentives affect the final pricing of the vehicle to the market (the table does not evaluate any markup from the seller/dealership).

It is important that both national and municipal governments work together. This has also been the case in Norway and has definitely impacted the success of battery vehicles. In other countries the incentives are mostly connected to free parking and free charging, which is though not as widely available in larger cities like has been done in Oslo.

The project team will update the matrixes during the next couple of years though it is not part of the project. However some new tax schemes have already been introduced in Iceland and are expected to be adopted in May 2012. It is therefore important to keep information alive as otherwise the work will be obsolete in a relatively short period of time.

## **7 Dissemination: Information activities and conferences**

The key target is to get the news regarding the web site and tools distributed to key players – such as car associations, fuel distributors, government organisation, regional authorities, etc. The project has already received the attention from various players as the activities in increasing the use of renewable fuel in the transport sector of the Nordic governments and/or market players raise interest.

Furthermore, some of the partners in the project are also partners in other supported projects in the „Electric Transport“ support scheme of the Nordic Energy Research. Some of these projects, for example „No Stone“ will host workshops around the Nordic countries. The project results of INTELECT will be introduced at all the „No Stone“ national workshops – first one took place on May 22, 2012 in Oslo and the next one on Oct 4, 2012 in Reykjavik. Also, the INTELECT partners will promote the material directly in the own countries and the project as such will be introduced at various events across the Nordic countries in the near future. By working in conjunction with other activities the results will reach a larger target group, will be better recognised and will hopefully be used by policy makers

## References

### **Denmark:**

Information about the current Danish registration tax: The Danish Ministry of Taxation:  
[http://www.skm.dk/tal\\_statistik/afgiftsberegning/2287.html](http://www.skm.dk/tal_statistik/afgiftsberegning/2287.html)

Vehicle excise duty tax (vægtafgiftsloven):  
<https://www.retsinformation.dk/forms/r0710.aspx?id=138068>

Rates of mineral oil tax:  
[http://www.skm.dk/tal\\_statistik/satser\\_og\\_beloeb/222.html](http://www.skm.dk/tal_statistik/satser_og_beloeb/222.html)

Rates of gas tax:  
[http://www.skm.dk/tal\\_statistik/satser\\_og\\_beloeb/210.html](http://www.skm.dk/tal_statistik/satser_og_beloeb/210.html)

Rates of CO2-tax:  
[http://www.skm.dk/tal\\_statistik/satser\\_og\\_beloeb/216.html](http://www.skm.dk/tal_statistik/satser_og_beloeb/216.html) and  
<https://www.retsinformation.dk/forms/r0710.aspx?id=133858>

Rates of nitrous tax:  
[http://www.skm.dk/tal\\_statistik/satser\\_og\\_beloeb/8187.html](http://www.skm.dk/tal_statistik/satser_og_beloeb/8187.html)

Taxation of bio fuels:  
<http://skat.dk/SKAT.aspx?old=1846591&vld=0&lang=PL>

Taxation of use of fuels (brændstofforbrugsafgiftsloven),  
[http://www.skm.dk/tal\\_statistik/satser\\_og\\_beloeb/183.html](http://www.skm.dk/tal_statistik/satser_og_beloeb/183.html) and  
<https://www.retsinformation.dk/Forms/R0710.aspx?id=137969>

Information about number of EVs etc. on the road is gathered from The Danish Car Importers Association:  
<http://www.bilimp.dk/>

### **Faroe Islands:**

Information on statistical data:  
<http://www.akstovan.fo>

Information on cars:  
<http://www.autoservice.fo>

### **Finland:**

Information on Vehicle taxation sheet:  
Finnish Acts and Degrees, Act on car tax (purchase tax) 1482/1994, (passed on 29.12.1994), amended by 1316/2011 (passed on 16.12.2011), implemented as of 1.4.2012 onwards.

Information on Fuel taxes sheet: Finnish Acts and Degrees, Act on the excise of liquid fuels, 1472/1994, (passed on 29.12.1994), amended by 1443/2011 (passed on 22.12.2011), implemented as of 1.1.2012 onwards.

Information on Annual taxation of vehicles: Finnish Acts and Degrees, Act on the vehicle tax, 1281/2003, (passed on 30.12.2003), amended by 1317/2011 (passed on 16.12.2011), implemented as of 1.1.2012.

All text of these acts are available in Finnish and Swedish at:  
<http://www.finlex.fi/en>

### **Greenland:**

Information regarding law material:  
<http://www.nanoq.gl>

Information regarding electricity price and electric metering:  
<http://www.nukissiofiit.gl>

Statistics regarding numbers of vehicles and roads:  
<http://www.stat.gl>

Information regarding gps data collectors:  
<http://www.ens.dk>

Data handling:  
<http://www.vikingegaarden.dk>

Data for the Think-vehicles  
<http://www.think.no>

Oil prices in Greenland  
<http://www.nunaoil.gl>

### **Iceland:**

Statistic information regarding vehicles and traffic:  
<http://us.is>

Information on law and legislation:  
<http://www.althingi.is>

Information on hydrogen and electric vehicles:  
<http://www.newenergy.is>

Electricity prices:  
<http://www.or.is>

Oil prices:  
<http://www.orkusetur.is>

### **Norway:**

Information on cars:  
<http://www.gronnbil.no>

Information council for Veitrafikken:  
<http://www.ofv.no>

State budget proposal 2012:  
<http://www.statsbudsjettet.no/Statsbudsjettet-2012/>

**Sweden:**

Information regarding purchasing vehicles:

<http://www.elbilsupphandling.se>

City of Stockholm:

<http://www.stockholm.se/Fristaende-webbplatser/Fackforvaltningssajter/Miljoforvaltningen/Miljobilar>

Swedish Transport Agency:

[www.transportstyrelsen.se/sv/Nyhetsarkiv/Supermiljobilspremie-infors-fran-och-med-1-januari-2012](http://www.transportstyrelsen.se/sv/Nyhetsarkiv/Supermiljobilspremie-infors-fran-och-med-1-januari-2012)

Stockholm Arlanda Airport:

<http://www.arlanda-flygplats.com/sv/Information--tjanster-till/Resenar/Till-och-fran-flygplatsen/Parkering/Miljobilsparkering>

Statistics Sweden:

[http://www.scb.se/default\\_2154.aspx](http://www.scb.se/default_2154.aspx)

Swedish Petroleum Institute

<http://spbi.se/>

Swedish Transport Agency

<http://www.transportstyrelsen.se/sv/Vag/Fordon/Fordonsskatt/Hur-bestams-skattens-storlek>

## Annex I

Here below is a table showing taxes on fuels in all the Nordic countries.

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
<b>Gasoline</b>							
Taxes							
Fixed tax (liter)	0,58	0,3	0,627	0,035	0,4	0,62	0,61
VAT	25	25	23	0	25,5	25	25
<b>Diesel</b>							
Taxes							
Fixed tax (liter)	0,44	0,107	0,44	0,035	0,37	0,49	0,53
VAT	25	25	23	0	25,5	25	25
<b>Bio-Methane</b>							
Taxes							
Fixed tax (liter)	0,44	N/A	0	37	0	0	0
VAT	25	N/A	23	0	25,5	25	25
<b>Natural Gas</b>							
Taxes							
Fixed tax (kg)	0,44	N/A	0,11	37	0	0	0,2
VAT	25	N/A	23	0	25,5	25	25
<b>Ethanol</b>							
Taxes							
Fixed tax (liter)	0,34	N/A	0,414	N.A.	N.A.	0	0
VAT	25	N/A	23	N.A.	25,5	25	25
<b>Electricity</b>							
Taxes							
Fixed tax (kWh)	0,1	0	0,01703	0,035	0	0,02	0,03
VAT	25	25	23	0	25,5	25	25
<b>Hydrogen</b>							
Taxes							
Fixed tax (kg)	0,39	0	N.A.	37	0	0	0
VAT	25	25	23	0	25,5	25	25
Fixed tax shown in € (EURO)							
VAT shown in %							

## Annex II

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
<b>Gasoline</b>							
Vehicle factory cost/inc. shipping	15.000	15.000	15.000	15.000	15.000	15.000	15.000
CO2 emission <b>119 g/km</b>	-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
<b>TOTAL</b>	<b>39.450</b>	<b>27.279</b>	<b>22.122</b>	<b>28.863</b>	<b>21.649</b>	<b>24.282</b>	<b>18.750</b>
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission <b>159 g/km</b>	269	1.613	5.775	0	5.250	4.791	0
Vehicles from 901 kg to 1.500 kg:	0	0	0	1.348	0	10.209	0
Other import taxes	35.814	12.730	0	18.984	0	584	0
VAT	5.250	5.250	6.158	0	6.694	5.250	5.250
<b>TOTAL</b>	<b>62.333</b>	<b>40.593</b>	<b>32.933</b>	<b>41.332</b>	<b>32.944</b>	<b>41.835</b>	<b>26.250</b>
Vehicle factory cost/inc. shipping	27.000	27.000	27.000	27.000	27.000	27.000	27.000
CO2 emission <b>199 g/km</b>	672	3.467	9.450	0	12.150	11.857	0
Vehicles from 1.501 kg to 1.800 kg:	0	0	0	1.909	0	17.497	0
Other import taxes	49.313	17.248	0	46.351	0	2.228	0
VAT	6.750	6.750	8.384	0	9.983	6.750	6.750
<b>TOTAL</b>	<b>83.735</b>	<b>54.464</b>	<b>44.834</b>	<b>75.260</b>	<b>49.133</b>	<b>65.332</b>	<b>33.750</b>
<b>Diesel</b>							
Vehicle factory cost/inc. shipping	15.000	15.000	15.000	15.000	15.000	15.000	15.000
CO2 emission <b>119 g/km</b>	-537	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
<b>TOTAL</b>	<b>40.525</b>	<b>27.279</b>	<b>22.122</b>	<b>28.863</b>	<b>21.649</b>	<b>24.282</b>	<b>18.750</b>
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission <b>159 g/km</b>	537	1.613	5.775	0	5.250	4.791	0
Vehicles from 901 kg to 1.500 kg:	0	0	0	1.348	0	10.209	0
Other import taxes	35.814	12.730	0	18.984	0	610	0
VAT	5.250	5.250	6.158	0	6.694	5.250	5.250
<b>TOTAL</b>	<b>62.602</b>	<b>40.593</b>	<b>32.933</b>	<b>41.332</b>	<b>32.944</b>	<b>41.861</b>	<b>26.250</b>
Vehicle factory cost/inc. shipping	27.000	27.000	27.000	27.000	27.000	27.000	27.000
CO2 emission <b>199 g/km</b>	941	3.467	9.450	0	12.150	11.857	0
Vehicles from 1.501 kg to 1.800 kg:	0	0	0	1.909	0	17.497	0
Other import taxes	0	17.248	0	46.351	0	2.756	0
VAT	6.750	6.750	8.384	0	9.983	6.750	6.750
<b>TOTAL</b>	<b>54.464</b>	<b>54.464</b>	<b>44.834</b>	<b>75.260</b>	<b>49.133</b>	<b>65.861</b>	<b>33.750</b>
<b>Methane/Natural gas</b>	As diesel						
Vehicle factory cost/inc. shipping	15.000	15.000	15.000	15.000	15.000	15.000	15.000
CO2 emission <b>119 g/km</b>		317	2.985		2.250	877	0
Other import taxes			0		0	4.312	0
VAT			4.137		4.399	344	3.750
Subsidy			0		-2.250	3.750	0
<b>TOTAL</b>	<b>N/A</b>	<b>N/A</b>	<b>22.122</b>	<b>N.A.</b>	<b>19.399</b>	<b>24.282</b>	<b>18.750</b>
Vehicle factory cost/inc. shipping	21.000	21.000	21.000	21.000	21.000	21.000	21.000
CO2 emission <b>159 g/km</b>		1.613	5.775		5.250	4.791	0
Other import taxes			0		0	10.209	0
VAT			6.158		6.694	584	5.250
Subsidy			0		-5.250	5.250	0
<b>TOTAL</b>	<b>N/A</b>	<b>N/A</b>	<b>32.933</b>	<b>N.A.</b>	<b>27.694</b>	<b>41.835</b>	<b>26.250</b>
Vehicle factory cost/inc. shipping	27.000	27.000	27.000	27.000	27.000	27.000	27.000
CO2 emission <b>199 g/km</b>		3.467	9.450		12.150	11.857	0
Other import taxes			0		0	17.497	0
VAT			8.384		9.983	2.228	6.750
Subsidy			0		-7.600	6.750	0
<b>TOTAL</b>	<b>N/A</b>	<b>N/A</b>	<b>44.834</b>	<b>N.A.</b>	<b>41.533</b>	<b>65.332</b>	<b>33.750</b>

	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden
<b>Battery</b>							
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	7.650	0	7.500
<b>TOTAL</b>	<b>37.500</b>	<b>37.500</b>	<b>38.745</b>	<b>30.000</b>	<b>37.650</b>	<b>30.000</b>	<b>37.500</b>
Vehicle factory cost/inc. shipping	35.000	35.000	35.000	35.000	35.000	35.000	35.000
Other import taxes	0	0	1.750	0	0	0	0
VAT	8.750	8.750	8.453	0	8.925	0	8.750
<b>TOTAL</b>	<b>43.750</b>	<b>43.750</b>	<b>45.203</b>	<b>35.000</b>	<b>43.925</b>	<b>35.000</b>	<b>43.750</b>
Vehicle factory cost/inc. shipping	40.000	40.000	40.000	40.000	40.000	40.000	40.000
Other import taxes	0	0	2.000	0	0	0	0
VAT	10.000	10.000	9.660	0	10.200	0	10.000
<b>TOTAL</b>	<b>50.000</b>	<b>50.000</b>	<b>51.660</b>	<b>40.000</b>	<b>50.200</b>	<b>40.000</b>	<b>50.000</b>
<b>Hydrogen</b>							
Vehicle factory cost/inc. shipping	40.000	40.000	40.000	40.000	40.000	40.000	40.000
Other import taxes	0	0	2.000	0	0	0	0
VAT	10.000	10.000	9.660	0	0	0	10.000
<b>TOTAL</b>	<b>50.000</b>	<b>50.000</b>	<b>51.660</b>	<b>40.000</b>	<b>40.000</b>	<b>40.000</b>	<b>50.000</b>
Vehicle factory cost/inc. shipping	60.000	60.000	60.000	60.000	60.000	60.000	60.000
Other import taxes	0	0	3.000	0	0	0	0
VAT	15.000	15.000	14.490	0	0	0	15.000
<b>TOTAL</b>	<b>75.000</b>	<b>75.000</b>	<b>77.490</b>	<b>60.000</b>	<b>60.000</b>	<b>60.000</b>	<b>75.000</b>
Vehicle factory cost/inc. shipping	80.000	80.000	80.000	80.000	80.000	80.000	80.000
Other import taxes	0	0	4.000	0	0	0	0
VAT	20.000	20.000	19.320	0	0	0	20.000
<b>TOTAL</b>	<b>100.000</b>	<b>100.000</b>	<b>103.320</b>	<b>80.000</b>	<b>80.000</b>	<b>80.000</b>	<b>100.000</b>

### Annex III

The table here below shows the annual vehicle taxation for different types of vehicles in the Nordic countries. There are far more variations in annual taxes than for other cost of operating a vehicle. This is one of the reasons why calculating the exact operation cost of different types of vehicles becomes more and more complicated. The complexity becomes even greater when depreciation is added as some vehicle types, specifically the new electric vehicles, have not had a long market introduction and therefore it is difficult to evaluate how the market will tackle depreciation of the vehicles. Lifetime of batteries and fuel cells can also drastically affect the depreciation rate – something that the market will learn more about in the near future.

Incentives for alternative/green vehicles in the Nordic countries									
	Denmark	Faroe Island	Finland	Greenland	Iceland	Norway	Sweden		
Gasoline/diesel vehicles	DK		gasoline&diesel		€	NOK	€		
Import taxes			€/ annum						
CO2 0-50 grams/km	Gas: 70, Diesel: 21	Taxes are according to weight of the vehicle. Starting for vehicles < 600 kg € 245/yr and then the tax increases for every few hundred kg up to € 600 for vehicles 2000-3500 kg.	19,35	0	31	2840	39,4		
CO2 51-80 grams/km	Gas: 70, Diesel: 21-99		20,08	0	31	2840	39,4		
CO2 81-100 grams/km	Gas: 70, Diesel: 99-263		28,47	0	31	2840	39,4		
CO2 101-115 grams/km	Gas: 70, Diesel: 263-433		42,71	0	31	2840	39,4		
CO2 116-120 grams/km	Gas: 137, Diesel: 433		55,48	0	31	2840	39,4		
CO2 121-140 grams/km	Gas: 137-271, Diesel: 433-605		60,22	0	31 + 0,75 for each g/CO2 above 121 g/CO2/km	2840	39,4 + 2,19 for each g CO2 above 121.		
CO2 141-160 grams/km	Gas: 271-339, Diesel: 605-777		80,30	0		2840			
CO2 161-180 grams/km	Gas: 406-470, Diesel: 777-951		103,29	0		2840			
CO2 181-200 grams/km	Gas: 537-605, Diesel: 951-1121		129,57	0		2840			
CO2 201-225 grams/km	Gas: 605-739, Diesel: 1121-1293		158,41	0		2840			
CO2 226-250 grams/km	Gas: 739-871, Diesel: 1293-1637		198,93	0		2840			
CO2 >250 grams/km	Gas: 871-2481, Diesel: 1637-3367		198,93	0		2840			
CO2 >400 grams/km			605,90	0					
<b>Bio methane gas vehicles</b>	As diesel	Same as above	11.32 €/100 kg/a	0		31		2840	39,4 + 2,19 for each g CO2 above 121. No tax at all first 5 years if Environmental class Euro 5, 6 and reduced value of fringe for companies for all vehicles, but ethanol and hybrid vehicles will not be included from January 2012.
<b>Natural gas vehicles</b>	As diesel	Same as above	11.32 €/100 kg/a	0		31		2840	
<b>Ethanol vehicles</b>	As diesel	Same as above	as gasoline	0	31	2840			
<b>Hybrid vehicles</b>	As gas or diesel	Same as above	as gasoline	0	31	2840			
<b>Hybrid plug-in</b>	As gas or diesel	Same as above	1.83 €/100 kg/yr	0	31	2840			
<b>Battery vehicles</b>	None (til end 2012)	Same as above	5.5 €/100 kg/yr	0	31	400			
<b>Hydrogen vehicles</b>	None (til end 2012)	Same as above	n/a	0	31	400			

