The Charging Station
Database for Electromobility

Presentation of

NOBIL & NIM

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What is NOBIL?

- A database for detailed information about charging stations.
- Key data with practical and technical information, accessibility, map coordinates, photos etc.
- The database is open with data available free of charge for anyone creating applications and services for EV-users or planners.
- The map applications are fully integrated, the information is real-time data.
- Initiated, developed and maintained by the Norwegian Electric Vehicle Association.
- A strategic choice was made to keep the database in public ownership. Hence funded and owned by Transnova.

About Transnova and the EV-association

- Transnova is a state body established in order to cut greenhouse gas emissions from transport.
- Increasing use of EVs and reducing fossil vehicles are targets.
- Transnova is a trial project 2009-2011 and expected to continue.
- Support research and test projects and funding EV-infrastructure.

- Norwegian Electric Vehicle Association organize
- the majority of EV-users in Norway.
- Nearly 20 years old. More than 2.000 members.
- Promote and facilitate use of chargeable vehicles.
- Elbil.no is the major EV-portal in Norway.
- More than 90% of new EV-owners get the association's «Welcome Pack» and first year's membership paid by the distributors.
- Runs or participate in several projects related to electric vehicles.

Electric Vehicles in Norway

- End of last year 3.366 electric cars, middle of this year 4.278, we will in 2011 pass 5.000 in a population of appr 5 millions.
- «Test case Norway» is a world leader for EV-introduction. Oslo is the capital in the world with highest EV-density. We have tens of year's experience with developing the framework.
- Radical incentives: free parking, free toll roads, access bus lane, liberal rules for parking, no purchase taxes, no VAT when buying an EV and more.
- Partly created for supporting our own EV-industry: Think & Buddy.
- Mainly private owners spent their own money on an electric car.
- Until now the barriere has been the quality and price of electric cars. This is changing and new models are more competitive in the market.

Charging Infrastructure in Norway

- Two major development programmes:
  - ✓ In 2009 and 2010, Transnova financed ca 1.800 charging points all over Norway, total cost ca € 5,5 million.
  - ✓ In 2008-2011 the city of Oslo is building 400 charging points to a cost of € 2 million.
- Supplemented by smaller contracts, in the end of last year Norway had 2,680 charging points. In September 2011 we reach 3.000.
- Nearly all are level 2 / mode 1 = Schuko 16A outlet.
- In 2011 Transnova use € 1,2 million to stimulate speed charging.
- During 2011 we expect to have nearly 40 speed charging stations (CHAdeMO), mainly around the four largest cities.
- Has been a fragmented building of infrastructure. Now we expect a stronger focus on strategy, business models and charging solutions.

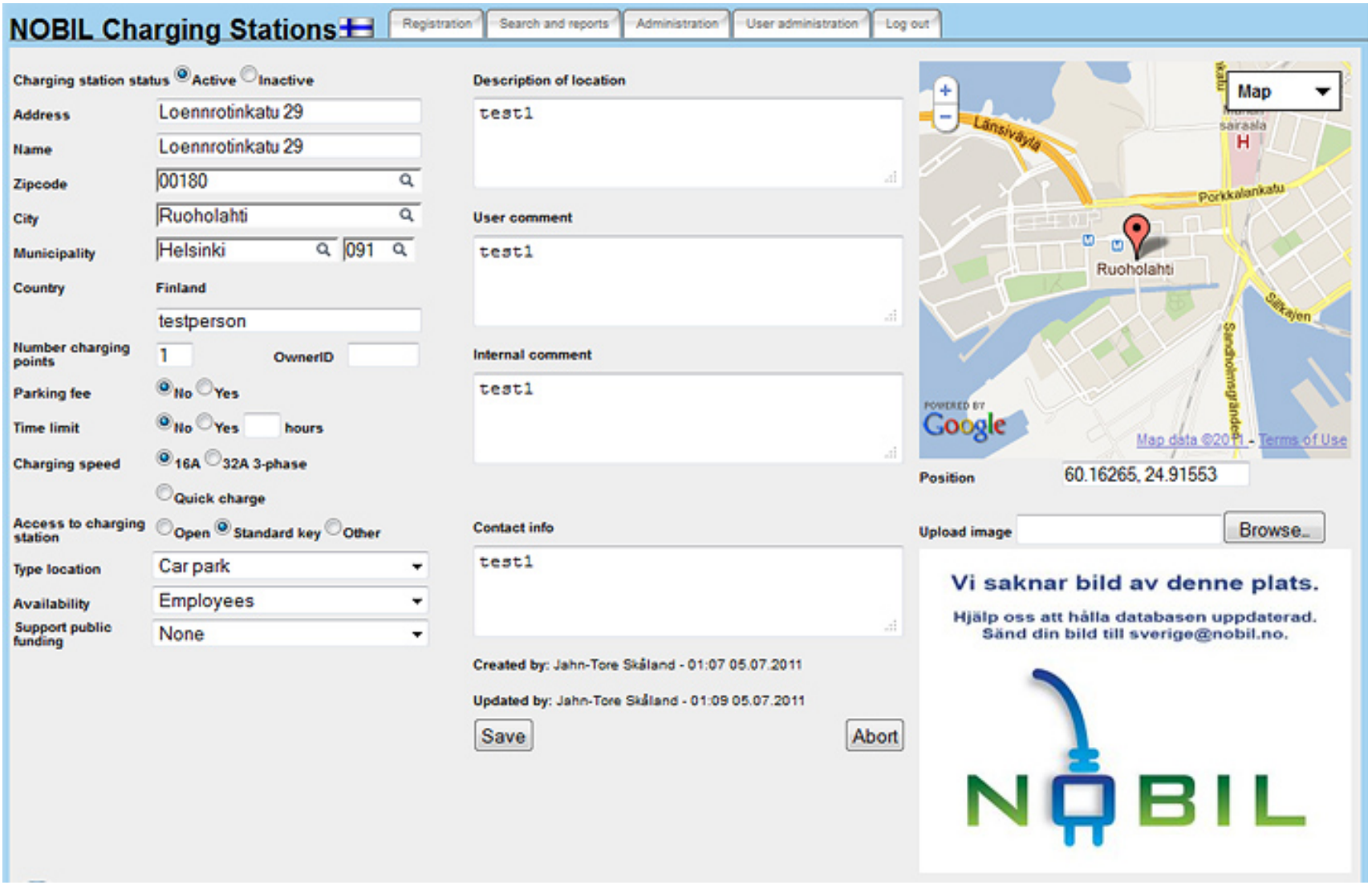
The start of NOBIL

- January 2010 the development started to satisfy needs at that time.
- Definition of key data done by EV-users, with their own and planners' needs in mind: location, access, rules for payment and time limitations, charging type, photo, external funding and more.
- Only charging points with min 16A and reserved parking for EVs.
- Open source and non-proprietary tools as PostgreSQL og PostGIS.
- Opened officially 6th June 2010 by the Minister of Transport.
- Data distribution through an open API to services and applications built upon the database: internet, mobile and GPS- navigators.
- The database gives us great opportunities for statistics and reports.

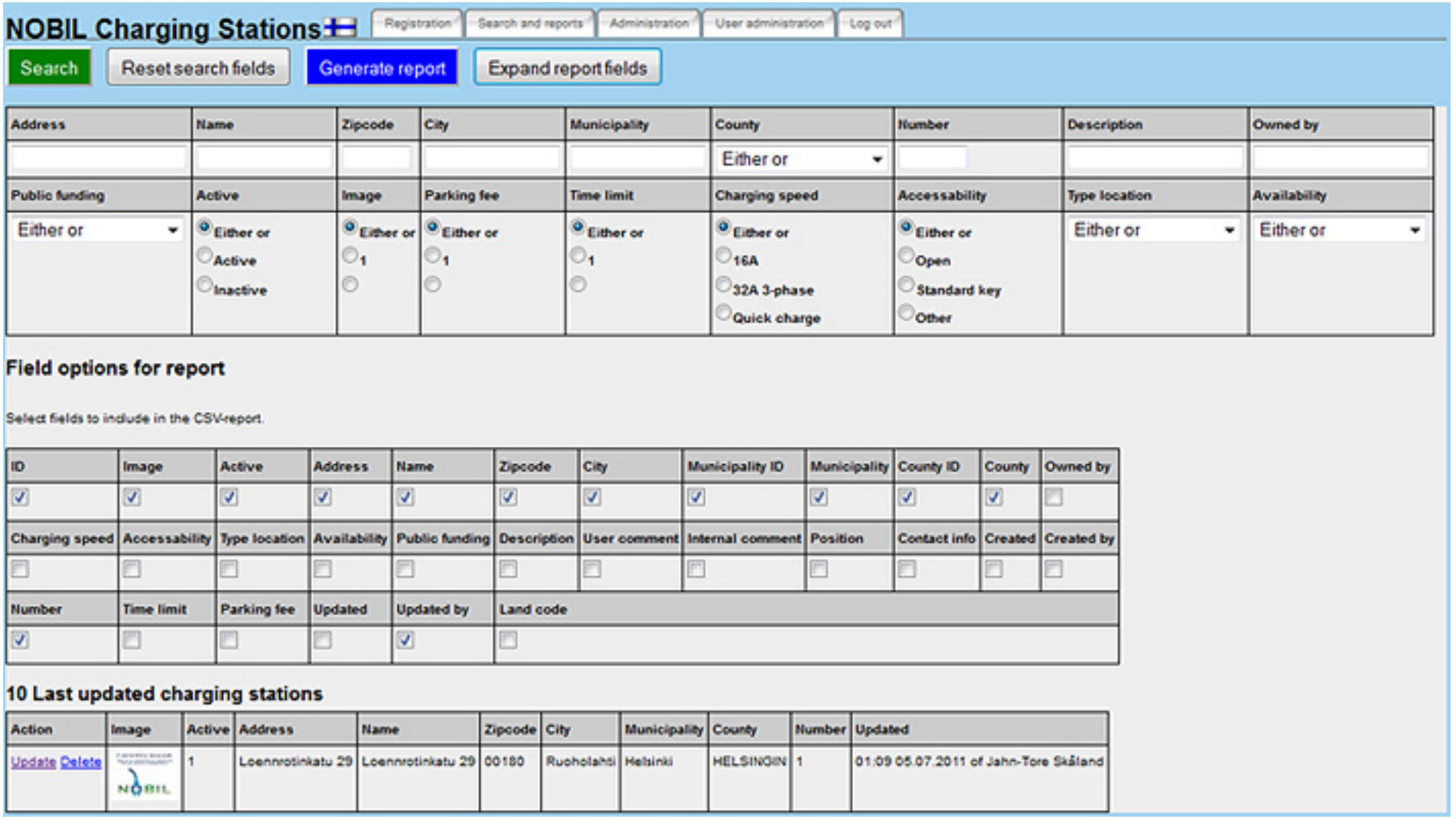
Collection and maintenance of data

- Transnova hired Norsk Elbilforening to collect data.
- 70% of the 2.680 charging points in 2010 had governmental funding, made the collection easier.
- Beside this, requests to hotels, shopping centra, parking companies, utility providers etc for delivery of data.
- At different web sites forms for reporting new or changes of charging stations.
- The quality of the database is maintained by the EV-association with great help from EV-users and infrastructure builders. Nearly daily input with adjusted info, photos and new charging stations.
- The existence and use of NOBIL secures continously new data.
- Now we have 900 stations (locations) with 3.000 points (outlets).

Registration ver 1.0



Search and reporting ver 1.0



NOBIL Charging Stations

Registration | Search and reports | Administration | User administration | Log out

Search | Reset search fields | Generate report | Expand report fields

Address	Name	Zipcode	City	Municipality	County	Number	Description	Owned by
					Either or			

Public funding	Active	Image	Parking fee	Time limit	Charging speed	Accessability	Type location	Availability
Either or	Either or Active Inactive	Either or 1	Either or 1	Either or 1	Either or 16A 32A 3-phase Quick charge	Either or Open Standard key Other	Either or	Either or

Field options for report

Select fields to include in the CSV-report.

ID	Image	Active	Address	Name	Zipcode	City	Municipality ID	Municipality	County ID	County	Owned by
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐

Charging speed	Accessability	Type location	Availability	Public funding	Description	User comment	Internal comment	Position	Contact info	Created	Created by
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

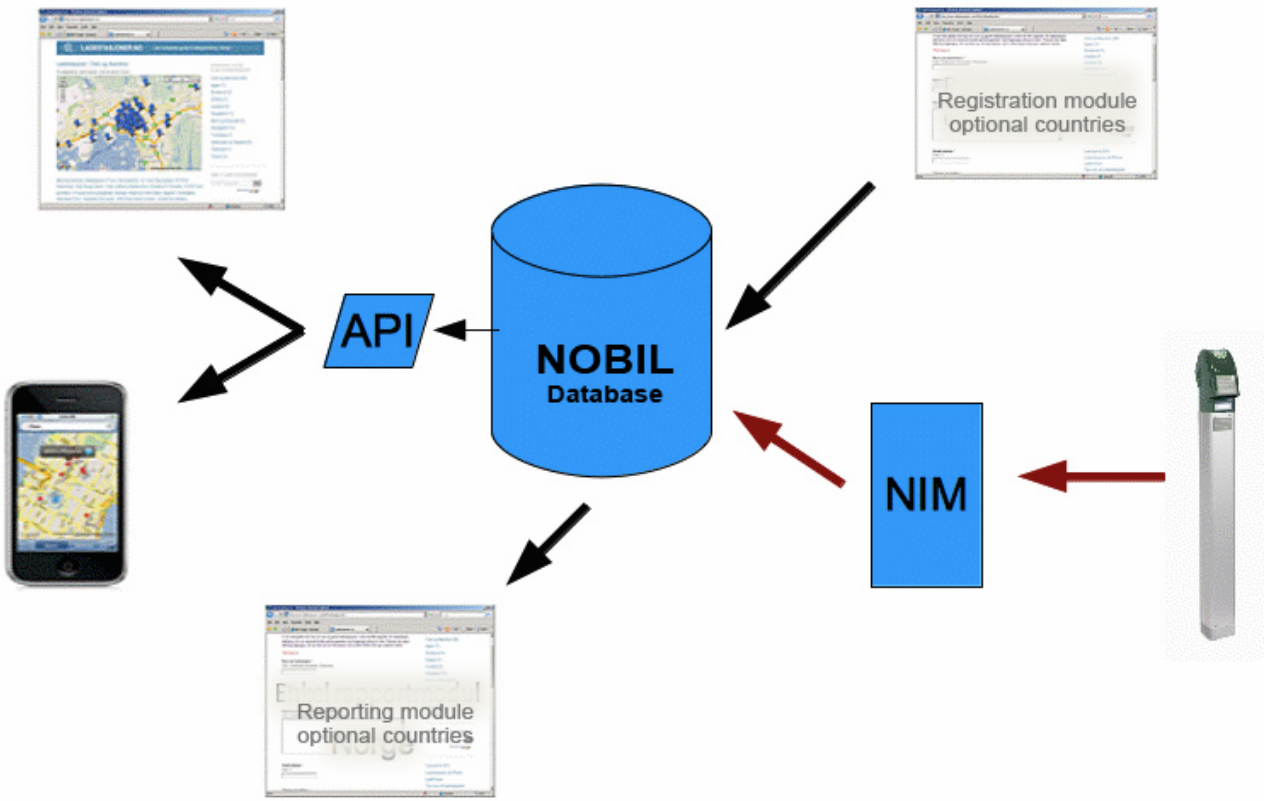
Number	Time limit	Parking fee	Updated	Updated by	Land code
☑	☐	☐	☐	☑	☐

10 Last updated charging stations

Action	Image	Active	Address	Name	Zipcode	City	Municipality	County	Number	Updated
Update Delete		1	Loennrotinkatu 29	Loennrotinkatu 29	00180	Ruoholahti	Helsinki	HELSINGIN	1	01:09 05.07.2011 of Jahn-Tore Skåland

NOBIL under transmission

- The world is changing – NOBIL too!
- First step was to develop NOBIL to handle different countries.
- All Nordic countries are prepared for input of charging stations.
- Next step is real time communication with intelligent infrastructure.
- Demand a new data set and architecture.
- Data will be registered both at station and point level.



Nobil Intelligent Module (NIM)

- A function facilitating interactivity between the database and communicative charging stations.
- Infrastructure pushing data according to defined XML. Try to standardize according to other open protocols.
- NIM is a gatekeeper, updating database with significant events.
- EV-users can get info of status, availability and average use.
- NIM receive info for energy use, charging time and more for generating a database of using patterns for infrastructure.
- NIM will open a channel between the EV-users and the infrastructure owners, as for reservation and payment.
- Important to define the line between NIM/NOBIL's activities and the infrastructure owner. NOBIL is not instrumental for operations, only collecting and reporting data.

Data available for registration - STATION

ID/ Active	Street/ house no/ name/ zip code/ city	Municipality/ Munc.no/ Region-County	Owner/ OwnerID	Amount charging points	Time limit	Parking fee	Accessability for who
This ID is old values from NOBIL/ Active register yes/no	Register + autogenerated	Autogenerated	Register	Register	Register yes/no + amount hours	Register yes/no	Register according to own table

Type location	Open 24 hrs	Public funding	Description place/ user/ internal	Contact info owner	Position	Image	Created when and by/ Changed when and by
Register according to own table	Register yes/no Evt lim descr user	Register according to own table	Fylles inn	Register	Autogenerated + register for correction	Upload	Autogenerated

True time info/ status	Available points	Use	URL/ blogpostID/ languageID/ country code	Updatingip-adress	International ID	Status timestamp/ error/ last charge
Register / From NIM	From NIM	%-value aggregated from saved historical data	Autogenerated + register language ISO 639-2 («nob») and country ISO 3166-1 («578»)	Register	Autogenerated according to ISO-3166-1 kode, e.G. NOR_00037	From NIM

Will be updated...

Data available for registration – POINT

ID	Vehicle type	Connector type	Charge capacity	Access to connector	Payment method
The international station-ID and continous numbers for points	Register according to own table	Register according to standard table	Register according to standard table	Register according to own table	Register according to own table

Reservation	Charge mode	Charger manufacturer	Status connector error/ sensor/ connector	Watt/ Voltage/ Meter value	Last used/ time stamp
Register yes/no	Register according to standard table	Register	From NIM	From NIM	From NIM

Will be updated...

Services and applications

- For internet we have services as Ladestasjoner.no, Klimabiler.no and Gronnbil.no using NOBIL for various purposes.
- For mobile phones we have LadeNå! and Nearby.
- Files available for download to most used GPS-navigators.
- Integrated in the electric cars by map providers.
- The best services are in true time delivering continously updated data.