# Report

## Deliverable 2.2.6: *Lessons learned from the NOBIL database solution*

| | |
|---|---|
| Project Acronym | IDACS |
| Project Full Name | ID and Data Collection for Sustainable Fuels in Europe |
| Grant Agreement number | MOVE/B4/SUB/2018-498/CEF/PSA/SI2.792684 |
| Activity | 2.2 Provision of static and dynamic data through the National Access Points of the Member States in requested format DATEX II |
| Deliverable Status | Final |
| Dissemination Level | Public |
| Version / date | V.1.0 (final, external) /30-06-2022 |
| Main authors | Hielke Schurer, Netherlands Enterprise Agency |
| Reviewers | Pauline Lanz, Netherlands Enterprise Agency<br>Anneke Bosma, Netherlands Enterprise Agency |

Co-financed by the Connecting Europe Facility of the European Union

# Table of Contents

# List of abbreviations

AC : Alternating current

CNG : Compressed Natural Gas

CPO : Charge Point Operator

DC : Direct current

EV : Electric vehicle

GNSS : Global Navigation Satellite System

IDRO : ID Registration Organization

LNG : Liquefied Natural Gas

NAP : National Access Point

OEM : Original equipment manufacturer

OCPI : Open Charge Point Interface

PSA : Programme Support Action

# 1. Introduction and purpose of this document

This document aims to present the final results of Deliverable 2.2.6: Report on the lessons learned from the NOBIL database solution.

According to the Grant Agreement, the Consortium should explore and report on the lessons learnt from the existing national databases, like the Nordic NOBIL (Enova) database solution, which is the official database and map on charging infrastructure for Norway, Sweden and Finland. The team of NOBIL and Enova agreed to advise the Consortium and share the lessons learnt with the IDACS project.

The document briefly introduces the Norwegian situation and NOBIL then continues with an elaboration on the current situation regarding the NOBIL database. This is then reflected on and the lessons learned for IDACS will be explained.

# 2. Methodology

In order to collect relevant information for this deliverable, desk research was performed and interviews with NOBIL and the Norwegian Electric Vehicle Association were conducted.

At the start of the project (2019) there has been contact with NOBIL to discuss the current state of affairs and to make an inventory of which lessons could already be used for the IDACS project, e.g. for procurement procedures. The most important points have been taken from this first meeting. At the same time, it turned out that a discussion further in the project would also be of added value because there would still be developments regarding NOBIL. Therefore, an additional interview was held (2021) to retrieve the latest information.

# 3. Introduction to NOBIL

When the number of EVs increased and the national charging infrastructure was being built in 2009-2010, questions arose on how to maximize the benefit from it. The answer was found in collecting all data in a central database, and distribute it with the goal to increase knowledge about the location and availability of charging infrastructure for electric vehicles. The idea was that easy accessible information would facilitate the EV user and stimulate the uptake of electric vehicles. And thus, NOBIL was born.

## 3.1 NOBIL

The goal of NOBIL is to have an open, publicly owned database that allows everyone to build services using standardized data free of charge. The governmental entity Enova and the Norwegian Electric Vehicle Association (Norsk Elbilforening) have worked together to develop this database.

*Governance*

NOBIL is developed and maintained by the Norwegian Electric Vehicle Association. Data is collected from EV-users, charging stations owners and operators and other contributors.

Collection and verification of data is prioritized to secure accurate and reliable information for EV-users in need of electricity.

As reported on the website of NOBIL, it was a strategic decision to ensure public ownership of the database to make the content available for everyone. Therefore NOBIL is financed and owned by Enova[1].

## 3.2 The Norwegian Electric Vehicle Association

The main goal of The Norwegian Electric Vehicle Association is to promote electric vehicles that run fully or partially on renewable energy. They believe electric vehicles are the best alternative for personal transport when it comes to the local environment, climate, energy efficiency and economy.

This EV association is a non-profit organization and represents electric car owners in Norway. They cooperate with the Norwegian government, the electric car industry, and other organizations.

The members elect a Board of Directors and the daily business is operated by the staff based in Oslo. The organization is a member of The European Association for Electromobility (AVERE) and the World Electric Vehicle Association (WEVA)[2].

## 3.3 Enova

Enova SF is owned by the Ministry of Climate and Environment. They contribute to reduce greenhouse gas emissions, development of energy and climate technology and a strengthened security of supply. Enova is the owner of the NOBIL database.

# 4. NOBIL database solution

This chapter describes the Norwegian situation of data collection and data provision at the NAP.

## 4.1 National Access Point

The data of NOBIL is accessible at the Norwegian National Access Point (NAP): NAP (transportportal.no). This NAP does not contain the data itself or the services that are made available for re-use, but only the metadata describing them. One can find links to the underlying services and the sets of data that can be accessed. In this case, there is a link to the NOBIL database for third party users.

[1] Website NOBIL, retrieved in 2021: https://info.nobil.no/eng
[2] Website NEVA, retrieved in 2021: https://elbil.no/english/

## 4.2 NOBIL Database

NOBIL is built with non-proprietary software tools, includes detailed information about charging stations and receives and distributes real-time data. Key data, including practical and technical information, accessibility for users, type of connectors and charging capacity, map coordinates, and pictures, are available for the general public. The database is continuously updated as new charging stations are built. NOBIL covers the Norwegian charging infrastructure very well and includes around 2,500 charging stations with over 12,000 charging points.

NOBIL's role is to gather information and communicate it effectively to third parties. NOBIL is not instrumental for operations (booking and payment), only for the collection and reporting of data. NOBIL does not interfere into the business of the operators and owners of the charging stations.

There is a distinction between the database and the services built on top of it. The EV-users and Enova take responsibility for the collection of charging station data, verification and making it available to everyone. It is up to the market to develop services using charging station data from NOBIL. Services the EV-users utilize in everyday life, whether the information is on web, in mobile apps or inside the navigation of the electric cars.

Data from NOBIL is freely available through an API (Application Programming Interface). Users can register as an API-user and accept the terms of use (Creative Commons). In return they will have the API-key for access sent. One can read more about the API here and download the documentation.

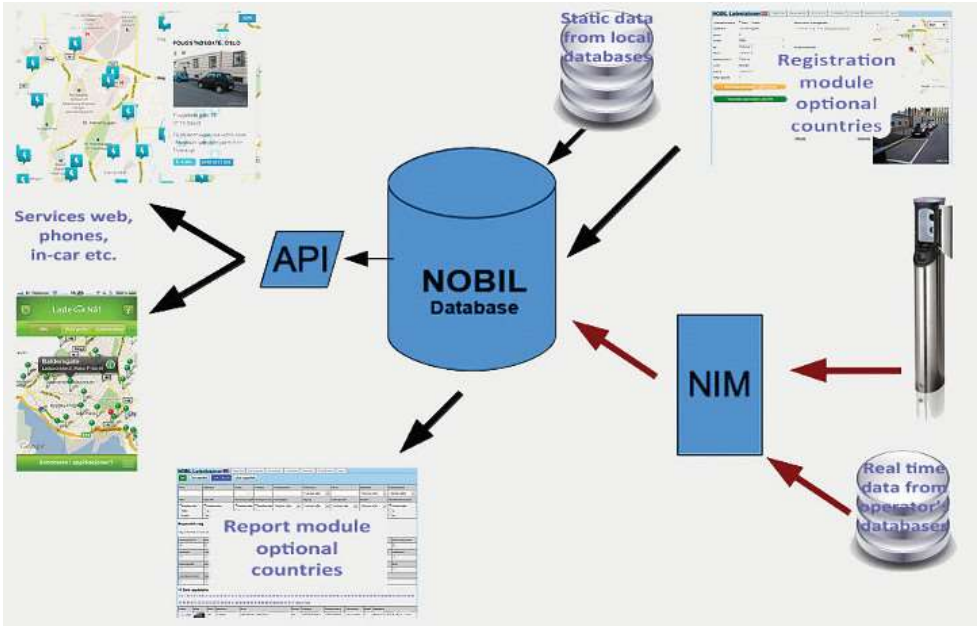


*Figure 1: Schematic overview NOBIL database (source: English (nobil.no))*

As can be seen in the figure above, both static and dynamic data is supplied to the NOBIL database. NIM= the real-time information part of NOBIL and is connected to CPOs. The static database is manually updated.

## 4.3 Data and protocols

*Data quality*

In terms of freshness of the data, the dynamic data is basically updated in real time. For this dynamic part of the database (the NIM part) there are direct connections with CPOs to the NOBIL database. So dynamic data is refreshed every time there is a change on the operator side.

The update frequency for static data is around 2 or 3 times a week. This consists of updating based on the changes that came in that week from EV drivers or operators. The changes from the EV drivers are not always directly double checked with the data base of the CPO. This is done regularly, namely when a new list with static data is received from the CPO. Then everything is double checked.

With regard to the quality of the data, NOBIL is therefore on the one hand dependent on the quality of the data from the CPO. And on the other hand, this is continuously (manually) improved with the comments, suggestions and tips from EV drivers.

Furthermore, with regard to the completeness of the data, it is not yet possible to always have all data available. This can be a challenge especially for dynamic data and especially for AC chargers. The quality of data about DC chargers is higher in that regard.

As will be discussed further below, there are no legal obligations for operators concerning data quality or supplying data to NOBIL.

*Data categories*

Below, the availability of the IDACS data categories is compared with the data categories available through NOBIL.

| **Available IDACS data categories at NOBIL database** | |
|---|---|
| ***IDACS data categories*** | ***NOBIL*** |
| *Static data:* | |
| Location:<br>○ GNSS coordinates;<br>○ Address (street name, zip code, city,…). | <br>✓<br>✓ |
| List of available charge-solutions (Power, Modes); | ✓ |
| List of available connectors (plugs, sockets, induction plate...); | ✓ |
| Opening hours, identification and payment methods; | ✓ |
| Contact info for owner/operator; | **x** |
| Full e-mobility code of the charging point (outlet). | ✓ |
| *Dynamic data:* | |
| Availability (if the station is operational/ non-operational); | ✓ |
| Occupation status (free, occupied); | ✓* |
| Price for ad-hoc charging. | **x** |

✓ = available
✓* = not always available
**x** = not available

*Table 1: IDACS data categories compared to NOBIL data categories*

NOBIL is also designed for hydrogen data. There are currently two stations that are included. So far there are no databases for other fuels like CNG and LNG.

*Protocols*

A commonly used protocol in Norway is the NOBIL protocol. This is actually one of the first protocols in the EV market. Because this is a widely used protocol, it will continue to be used. However, NOBIL makes an effort to make data also available in other (internationally used) protocols. For example, NOBIL it is the ambition to enable both receiving and sending data in OCPI. In the beginning of 2019, the Swedish Energy Agency reached out to NOBILs owner, Enova, with a request to develop NOBIL and increase both its data quality and quantity in the Nordic countries. As a result, a new functionality for automatic data registration was developed. The new data registration functionality is an implementation of a new OCPI v2.1.1 interface, which will allow CPOs to automatically publish data to NOBIL. Since multiple CPOs can utilize the same back-office system, integrating one system can connect NOBIL to multiple CPOs at the same time, given that there is an agreement between the individual CPOs and Enova. Enova has made successful contact with several CPOs in the Nordics, some which are prepared to make use of the new data registration in NOBIL at launch, and others may connect further down the road. Moreover, there has also been collaboration with Hubject to make the data available via the Open InterCharge Protocol (OICP).

*DATEXII*

Furthermore, there is no use of DATEXII for e-mobility data in NOBIL. This also makes sense given that this has only been possible since mid-2021. Because NOBIL is not yet familiar with DATEXII it is uncertain to say whether it may be used in the future.

## 4.4 Users

NOBIL is the primary database used in Norway and is used by different companies (for example OEMs, navigation tool providers and third party developers). An overview of users can be consulted here: https://info.nobil.no/tjenester. In general, the data is mostly used by service providers. Some of them are using different sources in addition to the NOBIL database.

*Connection with other countries*

In the Grant Agreement it is stated that the NOBIL database solution is the official database and map on charging infrastructure for Norway, Sweden and Finland. In reality this is somewhat different. NOBIL has 5 databases in 5 different languages. Norway, Sweden, Denmark, Finland and Iceland. It has been prepared for other countries to join but currently it is only actively used for Sweden. Other countries do not use it at the moment.

## 4.5 Funding

The NOBIL project is owned and funded by the government, namely Enova SF. It is developed and maintained by the Norwegian Electric Vehicle Association. Precise costs cannot be given but the budget is fairly limited.

## 4.6 Legislation

As mentioned before, there is no legislative base in Norway for data collection of electric charging points. Providing data is on a voluntary basis, although operators have an interest in

having their charging infrastructure found and therefore in sharing their data. There is however an exception if the charging infrastructure has been set up with public funding. In that case, parties are obliged to share the data. However, not many charge points are funded by the government.
Because there are no legal obligations for operators concerning data quality or supplying data to NOBIL, it is possible that the CPOs do not always have all data available for all charging infrastructure.

## 4.7 IDRO

Norway has not yet an IDRO. The ID codes used by CPOs have the following structure: NOR_12345_01. There is interest in the outcomes of IDACS regarding the ID codes , IDRO and IDRR. In the future, this could be set up by Enova.

# 5. Conclusions and lessons learned

A number of interesting lessons can be learned from the setup in Norway with the NOBIL database. Lessons that also emerged from other countries during the IDACS project.

Before discussing the lessons, we will briefly summarize the Norwegian situation: Norway has a NAP as a register which links to the NOBIL database. Anyone can access this public NOBIL database via a request for access to the API. This database contains real-time data from CPOs with a direct connection to the database. Static data is manually added based on updates of CPOs and tips from EV drivers.

### 5.1 Lessons learned

Looking at the NOBIL situation, we can see strengths as well as some challenges. The following lessons can be drawn from this for data provision at the NAP:

*Legislation*
A legislative obligation to share data is needed to obtain both static and dynamic data from all operators. Sharing dynamic data in particular can be sensitive and/or more expensive for operators. If this is kept on voluntary basis, not all (dynamic) data will be sufficiently accessible to third party users.
Setting legal requirements for the quality of the data (it must be complete, correct and up to date) can also contribute to a better data provision.

*Data quality and costs*
IT processes should be automated as much as possible and direct connections with CPOs (APIs) are desirable. Manual work takes a significant amount of time and costs. With the (future) increase in charging infrastructure, the amount of data will strongly increase. And also costs will only increase if data has to be entered manually.
It is therefore important to have as many direct connections as possible with the CPOs via, for example, APIs. For the right quality of the data, but also for limiting costs. Both dynamic and static data will have to be updated via direct connections.
It has also been found that it requires investments to get a good quality database. Both in the

Norwegian situation and in the IDACS countries it appears that setting up and maintaining data takes work (deduplication of data, correcting errors). Setting up a (public) database, with good quality data, requires financial resources.

*Protocols*
Harmonize formats and protocols. This makes data collection a lot more effective and efficient. If different formats are used, the data must first be converted or improved. As indicated at NOBIL, the data collection is considerably better when the same protocol is used or when these are harmonized.

*Architecture of NAP*
The architecture of a NAP does not necessarily matter for the public availability of good quality data. As the Norwegian situation demonstrates, it does not matter which architecture the NAP has. A NAP itself does not have to be a database in order to still have easy access to a database that is publicly available for third party users.

*Connection with other countries*
As the NOBIL database shows, it is possible to create shared databases between countries. It can therefore be useful when setting up a database to 'prepare' it for the connection for data for other countries. Clear agreements about funding are, however, necessary to make.

*Other*
Keep room for new developments. Charging infrastructure is developing fast, with different capabilities and standards. There must be room for this to be able to adjust this in the protocols and data categories.

## 5.2 Conclusion by consortium

The above-mentioned lessons are the lessons that the consortium draws after studying the NOBIL situation and comparing this to the situation of the IDACS Member States. The Norwegian situation does not have to be necessarily a best practice for other Member States and NOBIL has also indicated that it is working on developments to improve the database.

The Consortium emphasizes that suitable legislation is needed to enable proper public data provision. Without the right legislation it is challenging, if not impossible, to get all the dynamic data.

The consortium also believes that Member States should apply internationally used protocols (as described in Deliverable 2.2.5) as much as possible. In addition, the consortium endorses the view that easy access to public data does not require NAPs to become a database. A register can also provide easy access to an underlying database. In any case, it is of paramount important that the underlying database itself is of good quality, with as many direct connections as possible to CPOs (via APIs).

In conclusion, the NOBIL situation brings new insights that confirmed the findings from IDACS, supporting the above mentioned views from the consortium.

# Annex 1

References:

English (nobil.no)

Norwegian EV policy and market | Norsk elbilforening

About Enova – Learn about our work | Enova