OPEN INTERCHARGE PROTOCOL (OICP) SWITZERLAND PROFILE

System Task Customer Information (SKI) – SKI+ Team
https://transportdatamanagement.ch

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Document information

Description	This document contains information, assessments and explanations about the OICP standard which is to be used by the SFOE and the SKI+ team on behalf of the FOT (Federal Office of Transport).
Target group	People who conceive, design, develop and test business applications in the area of mobility in Switzerland and use or wish to use data and APIs under this standard.
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Change history

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1.1	optional	First version for publication.	M. Meier	2023-02-01

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1 What is this about?

This document describes the Open InterCharge Protocol (OICP) standard which is designated for the data exchange and interoperability of electric vehicle charging stations and is used in Switzerland by the Swiss Federal Office of Energy (SFOE). This document regulates how OICP is to be used in Switzerland.

2 Description and context

With the Electromobility Roadmap 2025, the Swiss Federal Office of Energy (SFOE) and around 60 Swiss companies and organisations aim to greatly increase the share of electric vehicles. This also requires an expansion of the charging station infrastructure and the associated IT systems. IT support is needed especially in two key areas: 1. information about the charging stations, 2. sales integration (roaming).

1. Information about locations and availabilities of the charging stations
In Switzerland, the Swiss Federal Office of Energy (SFOE) plays the leading role in providing information about locations and availabilities of charging stations with its electromobility data infrastructure (ich-tanke-strom.ch). ich-tanke-strom.ch offers static and real-time data on over 5000 charging stations in Switzerland in the form of a web application (http://ich-tanke-strom.ch) and open data (for bulk loads and queries, JSON-formatted). Charging stations can, however, also be found with search engines and specialist websites and apps.

The datasets are relatively simple in structure and can be converted. ich-tanke-strom.ch uses OICP or extracts of it. Data deliveries must also be made in the OICP format.

2. Charging station roaming (sales integration)
The second key need of customers is ease of use including payment and billing at all charging stations (without prior registration).

In Switzerland, direct payment at the charging station with cash or credit card is often only possible to a limited extent at present. Instead, smartphone apps are often used for activation, billing and payment. Charging station roaming is required to use charging stations outside one's own network. This means that, similar to mobile phone roaming, providers are integrated and can settle up with each other for services provided.

Roaming for charging stations has been developed and offered in Europe for over 10 years by various players. Unfortunately, a fragmented and not universally interoperable market has emerged. There are at least four competing standards within Europe (OCHP, OICP, eMIP, OCPI) as well as other proprietary corporate standards. Time and again, this causes problems for customers: missing details, unsuccessful charging, non-transparent or inflated prices.

The situation and the four standards eMIP, OCHP, OCPI and OICP were studied in detail by van der Kam & Bekkers (2020). Their main findings are:
  – The four standards are functionally quite similar and comparable.
  – They differ in some functional details and some non-functional aspects (see Figure 1).
  – The standards each have national roots: OCHP has German-Dutch roots, OICP has German roots, eMIP has French roots and OCPI has Dutch ones.
  – They are all essentially open and freely available.

– OICP and eMIP envisage a centralised roaming service (Hubject and GRIEVE respectively).

	OCHP v1.4	OCHP Direct v0.2	OICP v.2.2	eMIP v0.7.4	OCPI v.2.2
Charge point site host	X	X			X
Charge point manufacturer				X	
Charge point name			X	X	X
Charge point location image	X	X			X
Directions					X
Link to website	X	X			X
Scheduled availability status	X	X		X	X
Terms and conditions					X
Guaranteed power	X	X		X	
Voltage	X	X		X	X
Hub connection			X		
Real-time status information possible			X		
Predictive charge point usage			X		
Smart charging services			X		

Figure 1 – Some of the technical differences between EV roaming standards (excerpts only, Comparative analysis of standardized protocols for EV roaming. Report D6.1 for the evRoaming4EU project, 2020, Mart van der Kam, Rudi Bekkers)

The recommendations made by FOT and SKI+ in the "Discussion Basis for a NADIM standardisation concept" tend to favour OCPI (open, simple) and OICP (established).

To date, the SFOE and the FOT have not taken an active role the area of charging station roaming, whether in a regulatory capacity or as a service provider. Should this change in the future, an evaluation and choice of a standard based on precise requirements would be advisable.

In this profile, we highlight the OICP standard currently used by the SFOE for data exchange.

Open InterCharge Protocol (OICP)
Open InterCharge Protocol (OICP) for charging station roaming was developed by Hubject starting in 2013. In parallel, Hubject also offers the roaming service as well as a contractual framework for roaming between the participants. Since 2019, OICP is freely published (open source) under the Creative Commons Attribution-ShareAlike 4.0 International License.

With OICP, roaming can be obtained from Hubject as a service; theoretically, however, the service could also be offered by another service provider.

3 Who is responsible for this?
The Swiss Federal Office of Energy (SFOE) is responsible for the electromobility data infrastructure (ich-tanke-strom.ch).
OICP is being developed by the company Hubject.

4   Key websites

- http://ich-tanke-strom.ch
- Electromobility charging stations (admin.ch)
- https://github.com/SFOE/DIEMO documentation
- https://de.hubject.com/
- https://github.com/hubject/oicp

5   Underlying technologies and standards

SOAP web services (up to 2.2). JSON-based data structures, REST (from 2.3).

6   Uses

OICP has a clear focus on charging station roaming. The current version 2.3 offers the following services: eRoamingAuthorization, eRoamingChargeDetailRecord, eRoamingReservation, eRoamingEVSEData, eRoamingEVSEStatus, eRoamingDynamicPricing, eRoamingChargingNotifications.

7   Switzerland datasets

The eRoamingEVSEData and eRoamingEVSEStatus services mentioned (or parts of them) are currently used by the SFOE as a basis of the ich-tanke-strom.ch bulk datasets for data exchange.

8   Evaluation

Rough, qualitative evaluation or assessment by the SKI+ team[1]

P1 international	++	Used internationally; dominated by German companies.
P2 open	++	Open, free licence; somewhat sparsely described on GitHub.
P3 simple	++	Relatively simple structure, JSON-based.
P4 established	++	Widely used in Europe, among other standards.
P5 evolving	++	Semantic versioning, documented history, open feedback process.
P6 quality	++	Documentation properly up to date.
P7 compliant	+	Compliant with DATEX II; not coordinated with Transmodel.
P8 succinct	?	Not examined in detail.

9   Assessment

The international, European standardisation of charging station roaming has not yet been completed. OICP can be regarded as a temporary interim solution.

10 Specifications and recommendations

- For the time being, we will rely on OICP in consultation with and under the lead of the SFOE.
- Review based on future development and strategy.

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[1] The eight principles are explained in further detail in "Discussion basis for a NADIM standardisation concept=". Key: 0 = not fulfilled, + = low, ++ = medium, +++ = high fulfilment of the principle.

- Monitor developments in the EU.
- If necessary, drive standardisation forward as part of a roaming strategy.

11 Switzerland profile

Currently, the SFOE is in charge of ich-tanke-strom.ch and thus responsible for standardisation and profile creation.

Only parts of the data structure defined by OICP have been implemented for the charging stations.

11.1 Data download

Three datasets are available from the SFOE's GitHub page (https://github.com/SFOE/DIEMO-Documentation):
- Static charging station data (approx. 12 MB, bulk dataset in JSON data format based on OICP),
- Availability data (real-time data) of the charging stations (approx. 0.5 MB, bulk dataset in JSON data format loosely based on OICP),
- Geographic information of the charging stations as a GeoJSON file (approx. 10 MB).

The data formats are loosely based[2] on the OICP specification. The details in the specification and the application practice by the SFOE operator apply.

11.2 Data delivery

You can find instructions for charging infrastructure operators (CPO) on how to connect to ich-tanke-strom.ch at e-mobility charging stations (admin.ch).

The CPO delivers the data with a push operation, either by calling REST endpoints with JSON (preferred) or SOAP endpoints with XML (up to 2.2).

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[2] The datasets contain the note at the end: "AdditionalInfo": "These data are pulled from a GET endpoint that emulates the POST functionality found in OICP protocol specifications eRoamingPullEvse".