



Solar Charge API

Fostering data exchange between e-mobility and clean energy stakeholders





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With the contribution of:



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(CHELIOSRES

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Challenge & Context

Challenge 1: Data interoperability in EV charging

Data exchange that is required to implement smart charging incentives is hampered by discrepancies in data formats of different stakeholders. For example, data from EV Charging stations are usually formatted differently since each EV Charging Station software may utilise different data models.

Similarly, charging station management applications cannot easily request and receive standardised data from Solar Energy producers or rooftop solar asset managers. Every new data source may require data transformation before the data can be utilised by charging station operators.

Challenge 2: Remuneration of data providers

Real-time data for solar energy production from assets in specific regions or historic energy demand in charging stations are proprietary data that are not publicly available. To enable access to the data, the data providers need to receive remuneration for the data they provide. Structuring data monetization agreements is a complex process that may not be viable for bilateral exchanges between two medium size parties. This emphasises the need for a middleware service that aggregates data sources (open and proprietary).

Solution

The consortium has designed and deployed a data space for e-mobility and energy stakeholders that receives data from multiple sources, structures the data, and enables other stakeholders to access the data for the regions of interest. The data space will be initially deployed for regions of Greece and Croatia and enables dataspace participants to request data related to charging sessions and electricity consumption meters in these two locations managed by EV Loader and Grid One.

The key benefit for all participants joining the dataspace is that they can exchange structured data with other participants under defined rules. Consortium participants who are charge point operators receive data related to occupancy in other charging stations, grid conditions, and availability of renewable energy sources. Based on these data, these participants can design incentive mechanisms where they offer lower prices for drivers, when they charge their vehicle when specific conditions like high renewable energy availability, lower station occupancy are observed in the data received high. There are also strong incentives for renewable energy producers, such as HeliosRes to participate in the dataspace and provide data related to the historical, current and forecasted production of their assets, since they can be remunerated for this data flow by other data consumers.

How it works

The data space works in the following steps. A user from a partner organisation (e.g. a GridOne user or an Acrovolt station owner) wants to retrieve (subscribe to) data provided by the SolarCharge API (e.g. get occupancy/demand data from local charging points managed by EV Loader to further analyse local power demand and fine-tune their pricing policies).



Authorization according to iShare Framework

The partner user will first have to navigate to the SolarCharge API Marketplace, where they will need to authenticate themselves. The user selects the Identity provider (IdP) of their organisation, and are redirected to their organization's IdP portal to authenticate themselves (following an OIDC flow). The IdP validates that the SolarCharge API is a valid iSHARE Party, and prompts the user to allow access to the Marketplace. Once access is granted, the user is redirected back to the SolarCharge API Marketplace, authenticated, authorized and with some user info. Once the OIDC flow is successfully complete, the authorised user can select to subscribe to the data offering of their choice. Once the data offering is selected and paid via the FIWARE Marketplace components, an Authorization

policy is created that specifies the resources the user will have access to and what permissions they have upon those.

Integration of FIWARE components

NGSI LD and Orion LD Context broker

All outputs at the API layers of Smart Charge API will be formatted according to NGSI LD and Fiware Smart Data models. Entities that have subscribed to Solar Charge API, after passing user authentication through FIWARE Keyrock, will be able to post requests to the API. Entities can request data on the occupancy of charging stations in a specific region or suggested day ahead charging schedule to optimise occupancy or RES utilization via Orion LD Context broker.

FIWARE Keyrock, Kong API Gateway

Solar Charge API backend will be secured using a combination of Fiware Keyrock and Kong API Gateway combination. All entities seeking to access Solar Charge API via Orion LD context broker will need to generate oAuth credentials for all users accessing the service via Fiware Keyrock. The Kong API Gateway will be used to define the types of requests each entity can post to Solar Charge API.

Benefits & Impact

Solar Charge API can become a significant innovation and revenue driver for the parties involved in the data space development and maintenance.

Stakeholders participating in energy markets including utilities, CPOs and eMSPs need broader data to assess broader energy and charging demand beyond the confines of their own assets. However data exchange is hindered by the lack of trusted spaces where all stakeholders can exchange based on defined rules. Data sets also need to be structured and in cases of proprietary data flows monetary values need to be added so that data providers can be incentivize to share data outside of their own walls. These challenges are addressed by Solar Charge API. It is an enabling and value generating service for market participants. It helps data providers collect revenue for proprietary data they provide and data consumers to gain access to the data they need to generate

value for the clients. Solar Charge API will retaining a percentage of all subscription payments made by data consumers to data providers, in order to maintain the platform.

Currently the platform has onboarded data from three data providers (Helios RES, EV Loader, Gridone). Data consumers from the e-mobility industry have joined, including Acrovolt, a CPO in Greece.

More than 50 enterprise size consumers including large utilities and CPOs in Greece, Croatia and Cyprus could join the data space and benefit from valuable data flow in the future.

Added value through i4Trust

i4Trust program helped our technical team familiarize with frameworks such as iShare and authorization tools such Keyrock and Kong that are essential for setting the foundation for a dataspace that fosters fair exchange between participants. i4Trust consortium partners have deep understanding of essential tools such as NGSI LD context broker and helped us quickly navigate deployment tasks.

Next steps (if applicable)

Next steps for Solar Charge Dataspace involve:

- 1. Onboarding more data providers (solar producers, CPOs)
- 2. Onboarding more data consumers (eMSPs, CPOs)
- 3. Allowing more complex data queries so that each entity can request the data applicable for them with more specificity.

4. Improve User interface, and enable admins to control more functions through user interface instead of relying on console commands.

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Categories

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Founding Partners









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