SECURE TECHNOLOGY ALLIANCE

EV Charging Payments

February 5, 2020

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Who We Are

The Secure Technology Alliance is a not-for-profit, multi-industry association working to stimulate the understanding, adoption and widespread application of secure solutions.

We provide, in a collaborative, member-driven environment, education and information on how smart cards, embedded chip technology, and related hardware and software can be adopted across all markets in the United States.

What We Do

- Bring together stakeholders to effectively collaborate on promoting secure solutions technology and addressing industry challenges
- Publish white papers, webinars, workshops, newsletters, position papers and web content
- Create conferences and events that focus on specific markets and technology
- Offer education programs, training and industry certifications
- Provide networking opportunities for professionals to share ideas and knowledge
- Produce strong industry communications through public relations, web resources and social media

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Our Focus

- Access Control
- Authentication
- Healthcare
- Identity Management
- Internet of Things
- Mobile
- Payments
- Transportation

Member Benefits

- Certification
- Council Participation
- Education
- Industry Outreach
- Networking
- Technology Trends

Payments Council

… focuses on securing payments and payment applications in the U.S. through industry dialogue, commentary on standards and specifications, technical guidance, and educational programs about the means of improving the security of the payments infrastructure and enhancing the payments experience

SELECTED COUNCIL RESOURCES

- Biometric Payment Card
- Contactless Payments: Proposed Implementation Recommendations
- Contactless EMV Payments: Benefits for Consumers, Merchants and Issuers
- Contactless Payments in the U.S.: Guides for Merchants and Issuers
- Contactless Payments Security Q&A
- EMVCo Payment Account Reference (PAR): A Primer
- Implementation Considerations for Contactless Payment-Enabled Wearables
- IoT and Payments: Current Market Landscape
- Blockchain and Smart Card Technology

Introductions

- Randy Vanderhoof, Secure Technology Alliance

- Oliver Manahan, Infineon Technologies

- Jordan Kaplan, UL

- Barton Sidles, Hubject

- Nick Pisarev, G+D Mobile Security

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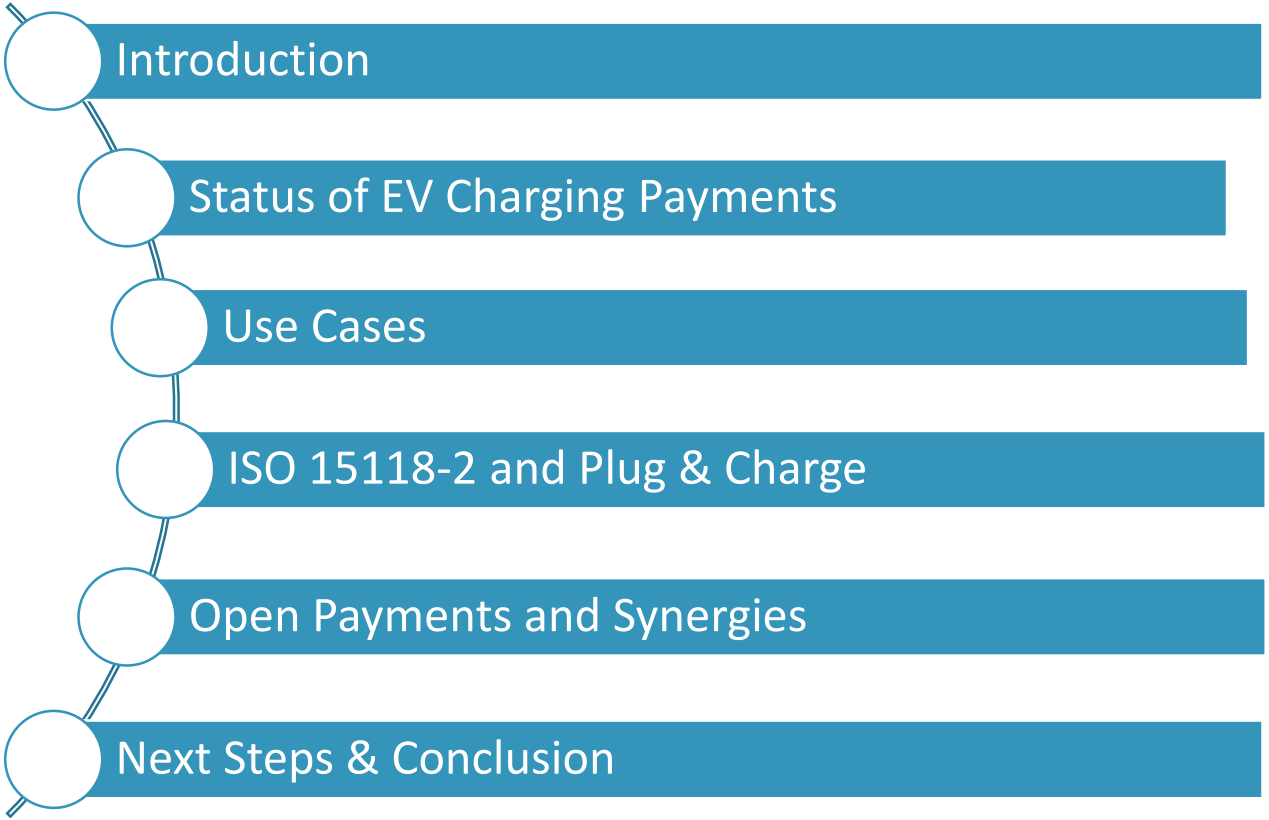
Agenda


Introduction
Status of EV Charging Payments
Use Cases
ISO 15118-2 and Plug & Charge
Open Payments and Synergies
Next Steps & Conclusion

Polling Question

What industry stakeholder category best describes your organization?

- Charging Network Provider
- Vehicle Manufacturer
- Financial / Payments
- Retailer
- Technology Provider or Other

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EV Charging Payments: Market Status

Oliver Manahan, Infineon Technologies

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EV Charging Interoperability

No driver today questions the ability to approach a gas station and fill-up with gas. This is **NOT** the case with EV charging today:

Questions EV drivers ask themselves:

- Is the charging port compatible with my vehicle?
- How fast will I be able to charge?
- What do I need to do to gain access:
  - Is it free?
  - Is there a cost – if so, how much?
  - Do I require an app, fob etc. to gain access?
- Will I be able to gain access easily or will there be challenges?
- Will I understand the sign-in instructions, will I need to call customer service, download an app?

EV Charging Availability

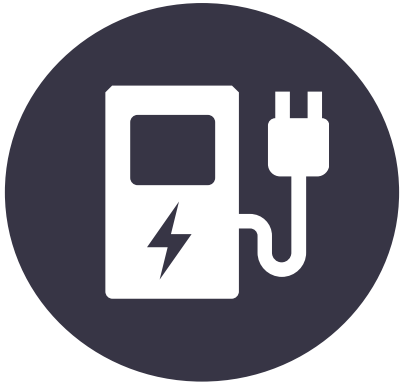
The number of charging stations will greatly exceed the number of gas stations/pumps today. The nature of electric vehicle supply equipment (EVSE) and supply of electricity differ compared to supply of gas.

To scale, EV charging networks will need to have:

- Simplistic and ubiquitous technology for access and payment
- Deployment – paying for energy supply

U.S. EV Market Overview

Electric Vehicles
- 1.2M current
- 18M projection 2030



Public Charging Infrastructure
- ~60,000 current
- 900,000 projection 2030

Government
- $7,500 federal tax credit (200,000 EVs / manufacturer)
- Additional state tax credit depending on state

Market statistic slides provided by Hubject
Source: Edison Institute, June 2019

Automaker Investment - Over $100 Billion in EV


2019 Audi e-tron


2018 Nissan Leaf


2020 Porsche Mission


2019 Jaguar I-Pace

Automaker	Electric Model Forecast
BMW	12 electric models by 2021
Ford	6 electric models by 2021
General Motors	4 electrified models by 2020
Mercedes	4 electrified models by 2020
Rivian	2 electrified models by 2021
Tesla	3-4 electric models by 2020
Volkswagen Group	11 electric models by 2022
Volvo	7 electric models by 2022

Source: MJ Bradley


2020 BMW iX3


2020 Mercedes-Benz EQ


2020 Volvo XC40


2020 Tesla Model Y

EV Stats

U.S. Average

January 11, 2020

Sources: Bloomberg, Statista, City Observatory

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EV Charging Payments Use Cases

Jordan Kaplan, UL

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Use Cases - Overview

Home Garage
Home Exterior
Multi-Family Dwelling

Workplace Charging
Entertainment/Shopping/Restaurants
Gas Stations/Convenience Stores
Street Parking

Inductive Charging
Peer-to-Peer Charging
Plug & Charge

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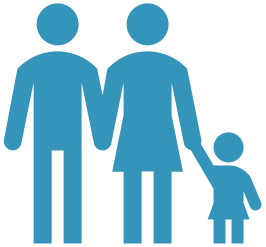
Over Night Stay at Hotel

Use Case – Over Night Stay at Hotel

Number of Electric Vehicles are steadily increasing in US



Opportunity for hotels to meet demand and add value for their guests

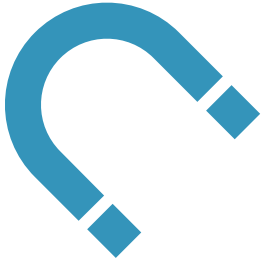
Large hotel chains have already been implementing EV Charging Stations

Guests should have the ability to use the same payment method for their hotel stay and EV Charging.

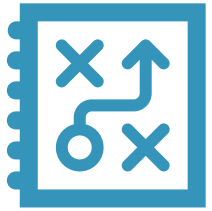
Visit to a Grocery Store

Use Case – Visit to a Grocery Store

Grocery stores are selling 14.5% of all gasoline in US



Unique way to attract customers and extend store time



Large grocery chains have already been implementing EV Charging Stations

Customers should have the ability to use the same payment method for groceries and EV Charging.

California Government – Open Access Charging

California Senate Bill 454

- Drivers using any electric vehicle supply equipment (EVSE) shall not be required to pay a subscription fee or become a member
- Drivers shall have the choice to pay with credit card or mobile pay or both
- All fees associated with a charging session shall be disclosed at point of sale
- Payment Requirements:
  - Europay MasterCard Visa (EMV) chip
  - Near Field Communications (NFC) reader
  - Must comply with industry data security standards
  - Payment hardware may be installed on a kiosk or individual EVSE

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ISO 15118-2 and Plug & Charge

Barton Sidles, Hubject

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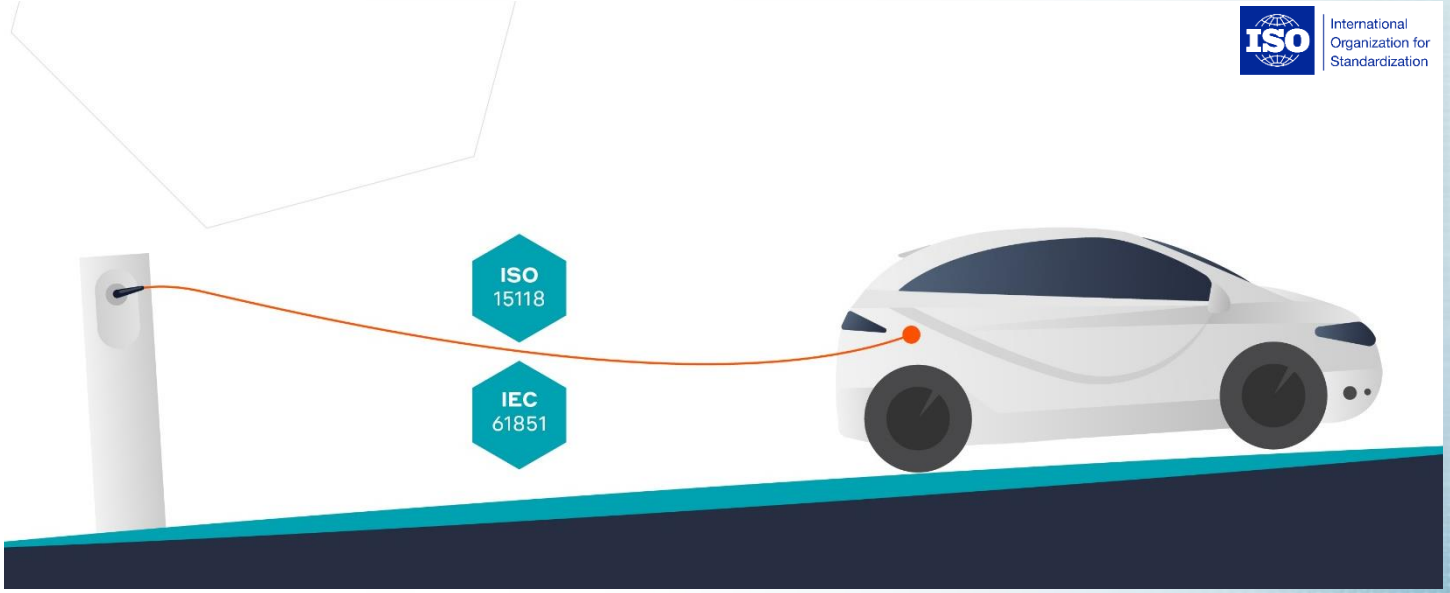
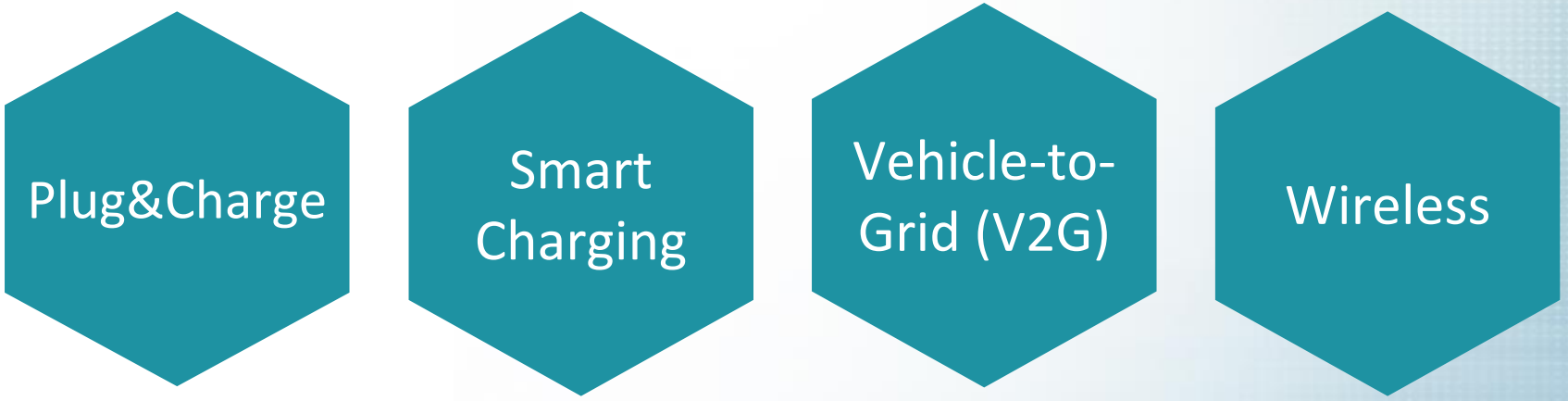
ISO 15118

ISO 15118 specifies the digital communication between Electric Vehicle (EV) and the charger or Electric Vehicle Supply Equipment (EVSE)



ISO 15118 EV Charging Use Cases



Plug&Charge Stakeholder Roles

PKI & Ecosystem

Trusted party for issuing the certificates and managing data pools

Certificate Authority

Mobility Operator

Charging relationship with EV driver
(e.g. charging network, auto OEM, utility, retailer, fleet)

CONT **Contract Certificate**

Automaker

Vehicle manufacturer
(e.g. cars, vans, buses, trucks)

PROV **Provisioning Certificate**

ISO 15118

Charge Port Operator

Charging station owner & operator
(e.g. utility, charging network, retailer, port)

LEAF **Leaf Certificate**

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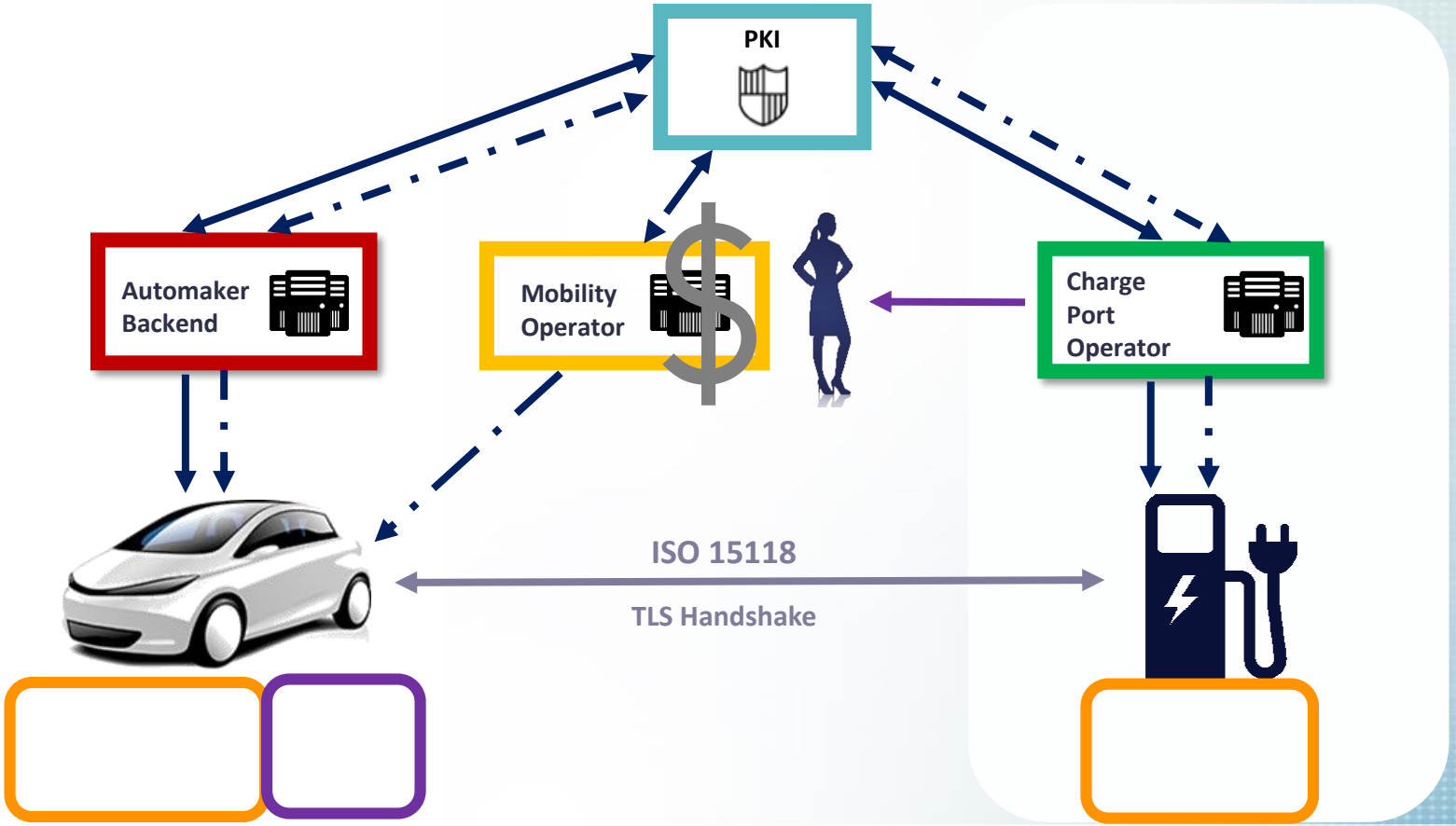
Plug&Charge Ecosystem



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Open Payments & Synergies

Nick Pisarev, G+D Mobile Security

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Payment Technology Fundamentals

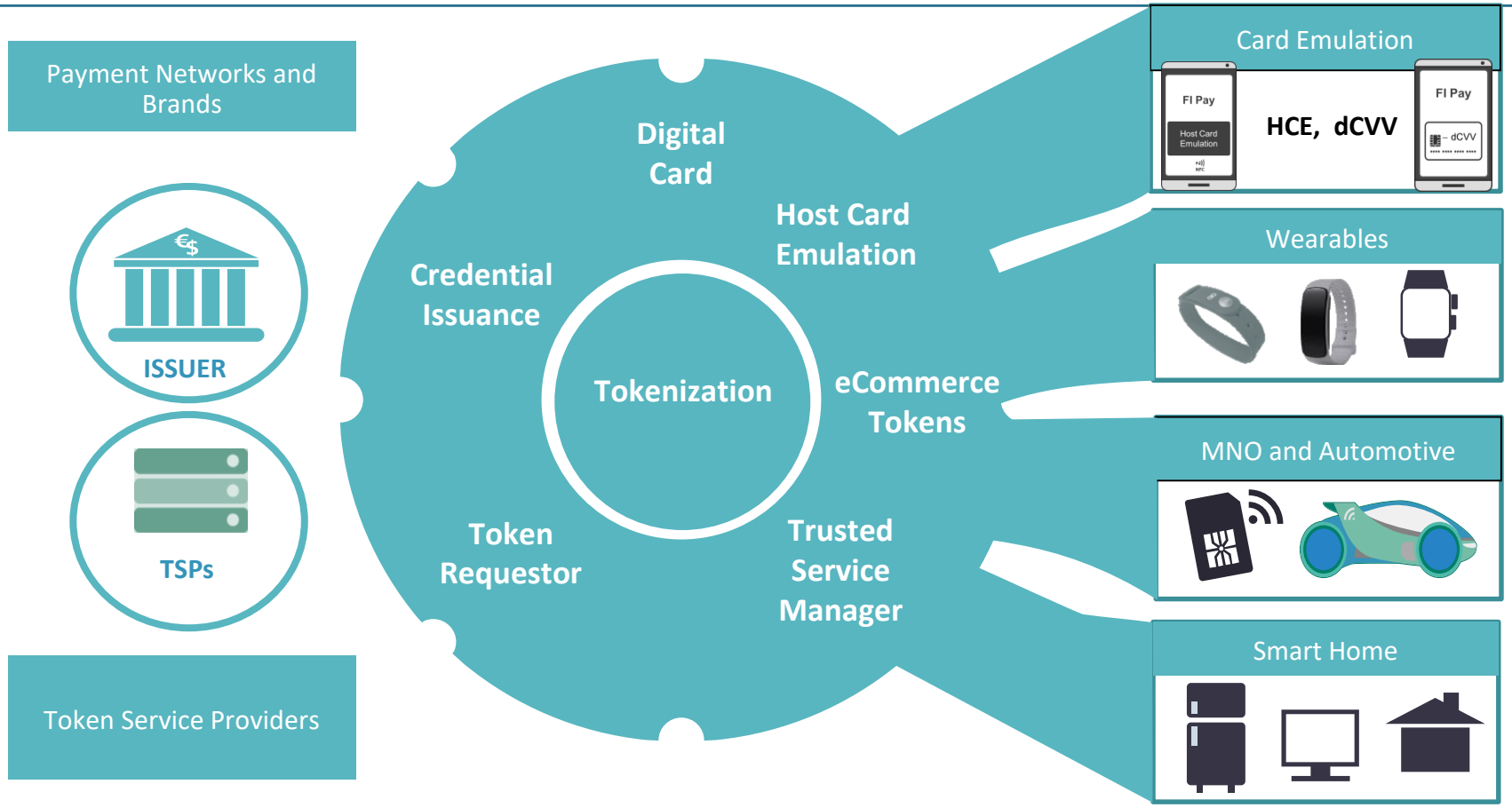
EMVCo – the Global Standard for Secure Payment

Secure Element based set of cryptographic standards combining symmetric and asymmetric cryptographic algorithms using:

ISO 7816 – Chip technology for:

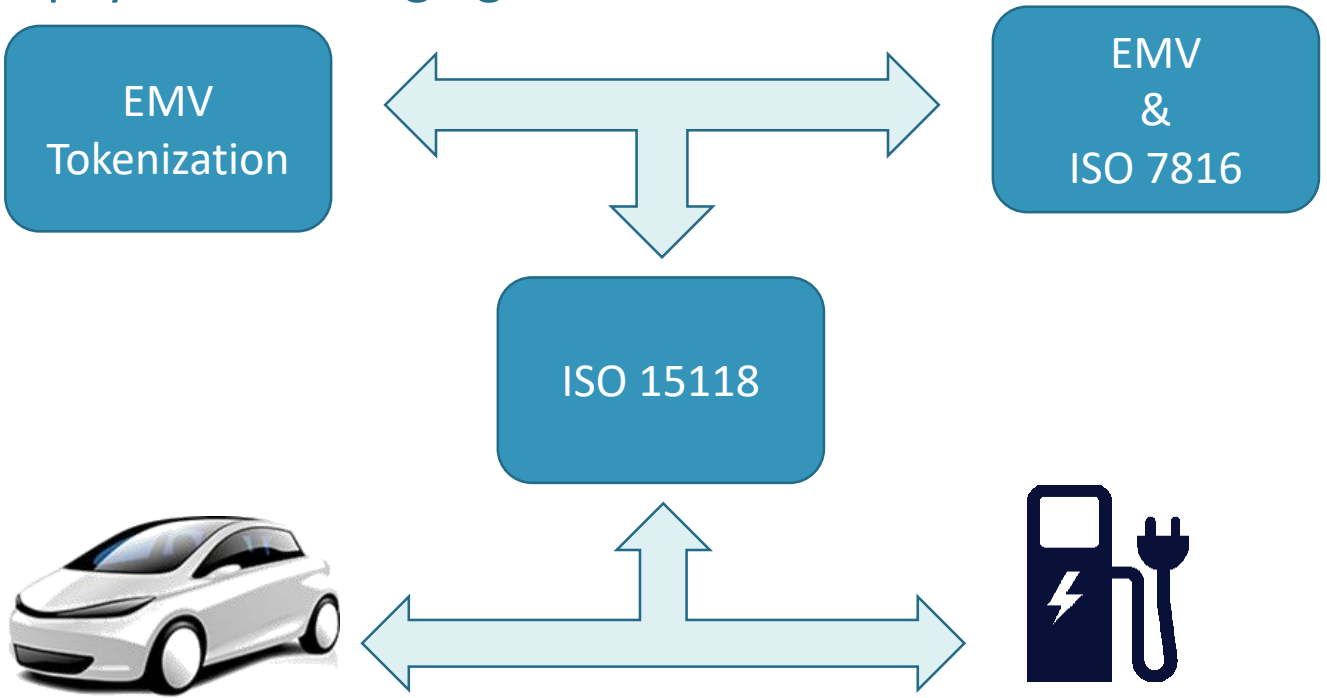
- Authentication via transaction cryptogram and/or certificates
- Payment User Verification
- Authorization

Payment Credential Proliferation

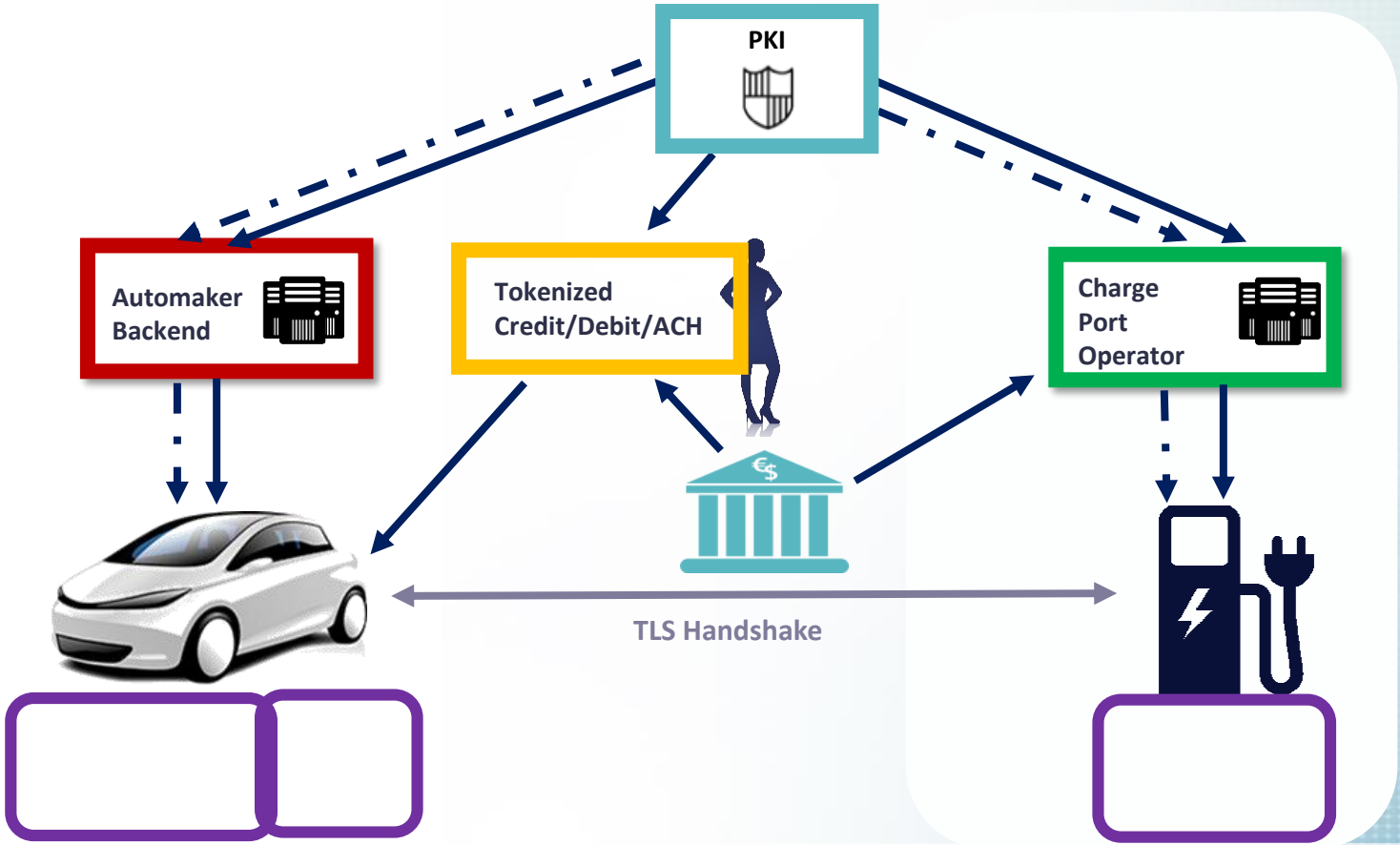


Secure Technology Alliance Payments Council Work in Progress

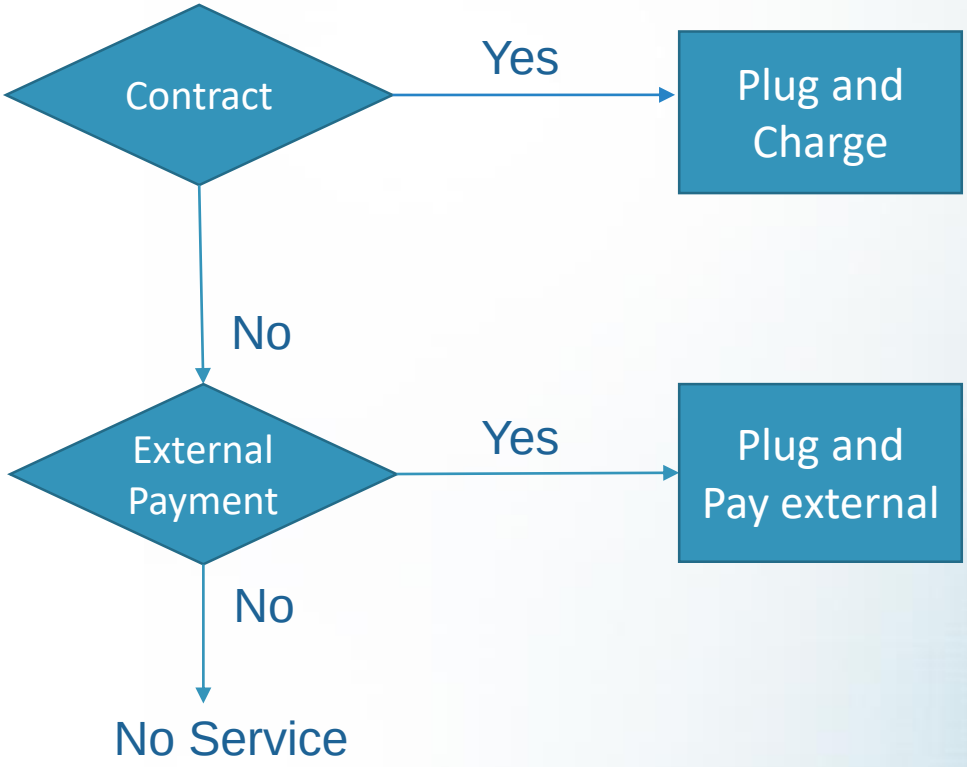
Find synergies to between existing standards and innovate the way we pay for EV charging:



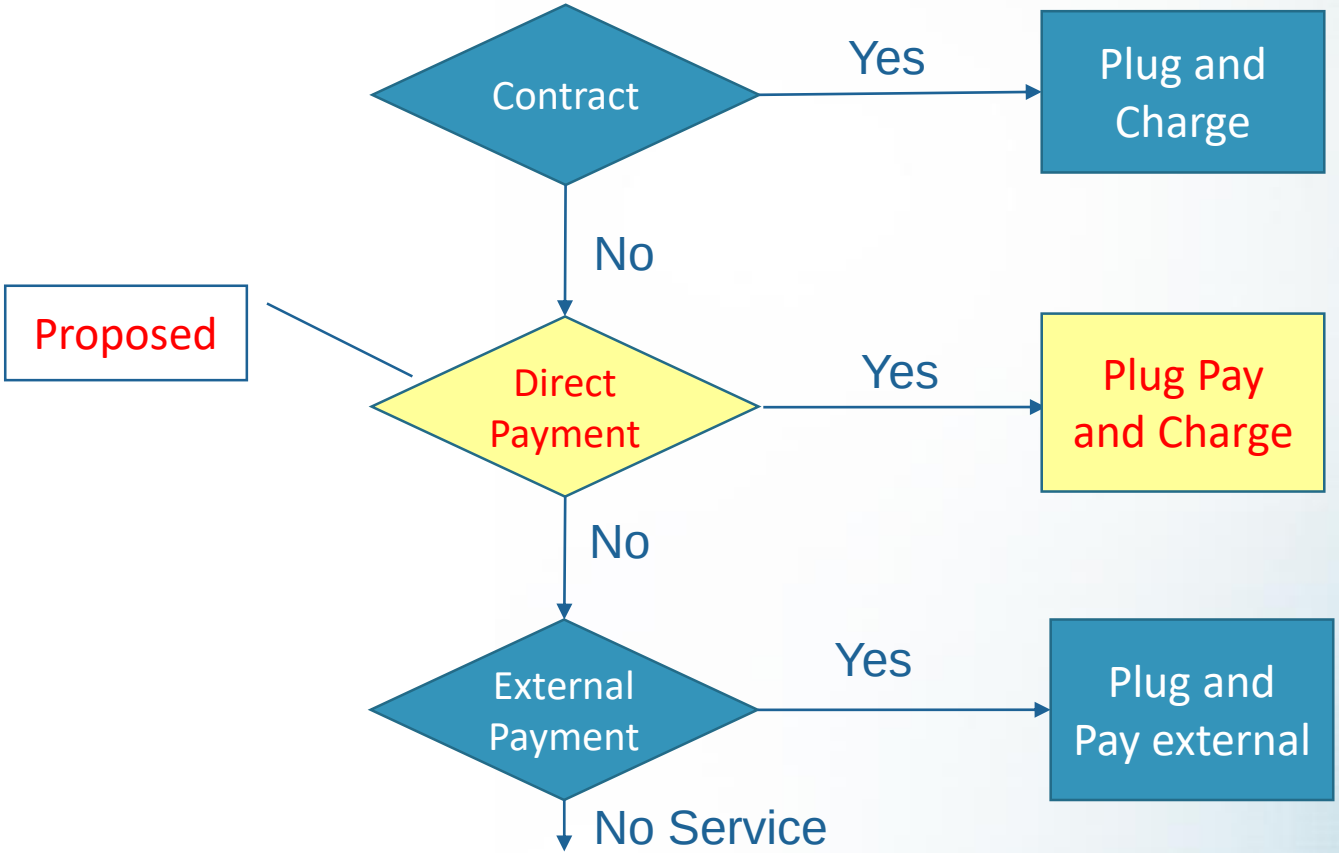
Plug&Charge Ecosystem: Proposed



ISO 15118 - Payment (Authorization) Path - Today

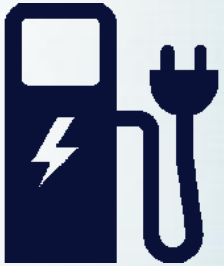


ISO 15118 - Payment (Authorization) Path - Proposed



Next Steps and Conclusion

Industry Participation



Propose / Recommend implementation

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Q&A

Payments Resources

- **2020 Payments Summit** – https://www.stapayments.com/
  - February 25-27, 2020 – Salt Lake City, UT
- **Secure Technology Alliance Knowledge Center** – https://www.securetechalliance.org/knowledge-center/
  - Educational resources on the use of secure payments technologies, including EMV, contactless, mobile, IoT and biometrics
- **U.S. Payments Forum** – https://www.uspaymentsforum.org
  - Resources on the implementation of new and emerging payments technologies in the U.S.

Speaker Contact Information

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