Australians overseas: key findings from the VGN delegation in Europe

Nodoka Nakamichi, Climate KIC Australia / Vehicle Grid Network

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Australians overseas

Key findings from VGN in Europe

Nodoka Nakamichi | Vehicle-Grid Network Lead

Accelerating vehicle-grid integration through coordinated action

VGN convenes industry, government, research and community organisations to accelerate the deployment of bidirectional EV charging in Australia, while maximising benefits for people, businesses and the grid

35+ active partners

4 industry roundtables

3 working groups

4 technical delegations

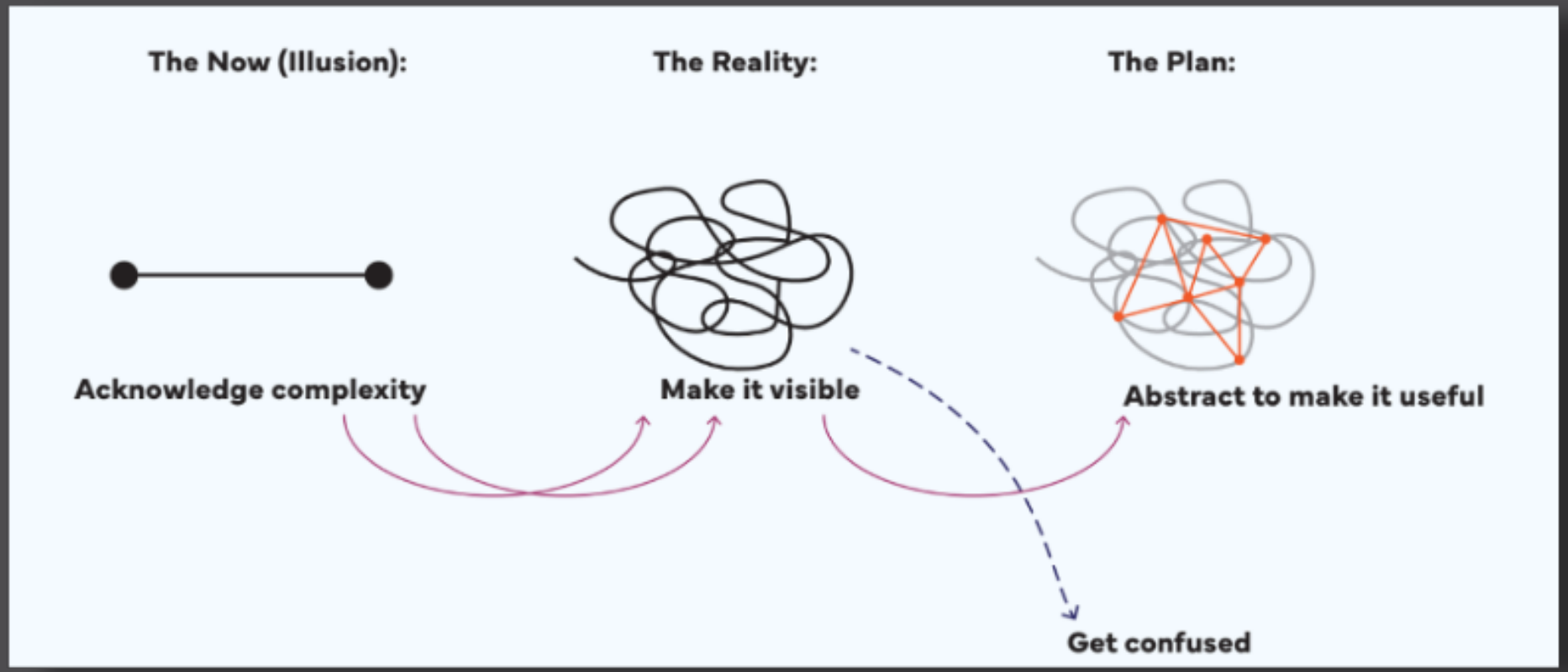
UN-ECE roadmap contribution

PRIORTY QUESTION What sequence of activities can unlock V2G at scale?



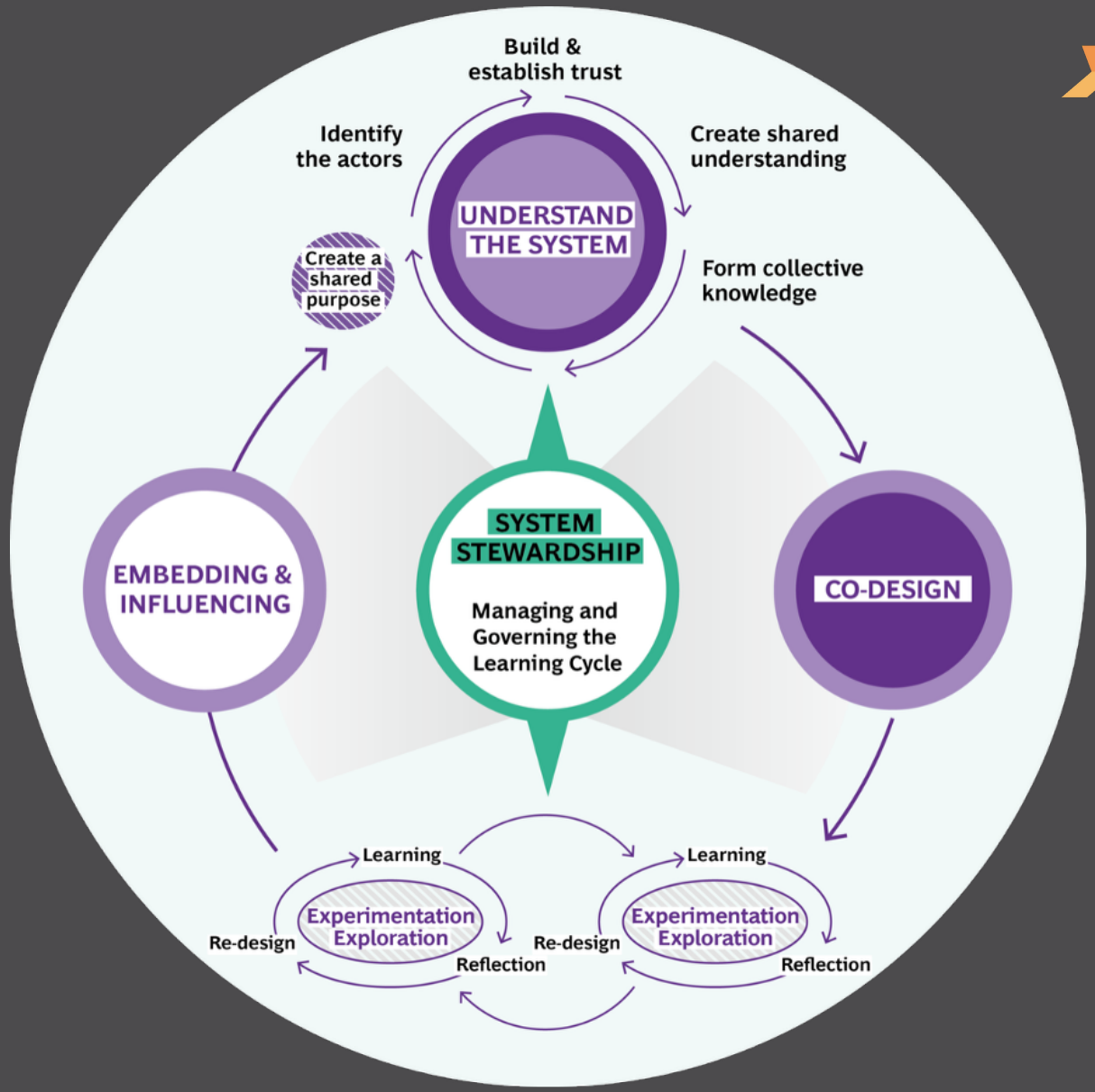
Our approach

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How VGN works

Adaptive, iterative cycles



EVs are mobility assets first

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Travel sets grid behaviour
EVs move across homes, workplaces and networks; when and where they charge is a planning variable.

Drivers come first
The car has to be ready when people need it, grid services fit around how vehicles are used

Automakers set capability
With no local manufacturing, V2G depends on what global OEMs enable, certify and warrant here.

Australia's automotive sector context

A vehicle rule-taker: UNECE and other regulations adopted through the Australian Design Rules

Since 2017, the largest car market with no local production; OEMs became sales-reactive and absent from local VGI standards, regulation and policy development

Open imports: more choice than the EU or US, less influence; Chinese brands now lead

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Working Group 1 | Standards, testing & interoperability

What WG1 set out to do this year

PRIORITY 1

VGI interoperability framework

- **Architecture:** current, transitional and target stacks, EV ⇄ EVSE ⇄ CSMS ⇄ DSO plus PKI
- **Minimum requirements:** what OEMs, EVSE, CSMS/EMS, DNSPs and governments must support
- **OEM and warranty:** what lets an automaker certify and warrant V2G here
- **Interfaces and trust:** how ISO 15118, OCPP and CSIP-AUS hand off, and who anchors certificates

PRIORITY 2

Testing and verification pathways

- **Evidence:** how conformance, interoperability and compatibility differ, and who needs which
- **Capability:** what exists, what's missing, distributed facilities or one greenfield lab
- **Lifecycle:** who re-tests after firmware and OTA updates
- **Recognition:** when international certification is enough

VGI interoperability framework due for public release February 2027.

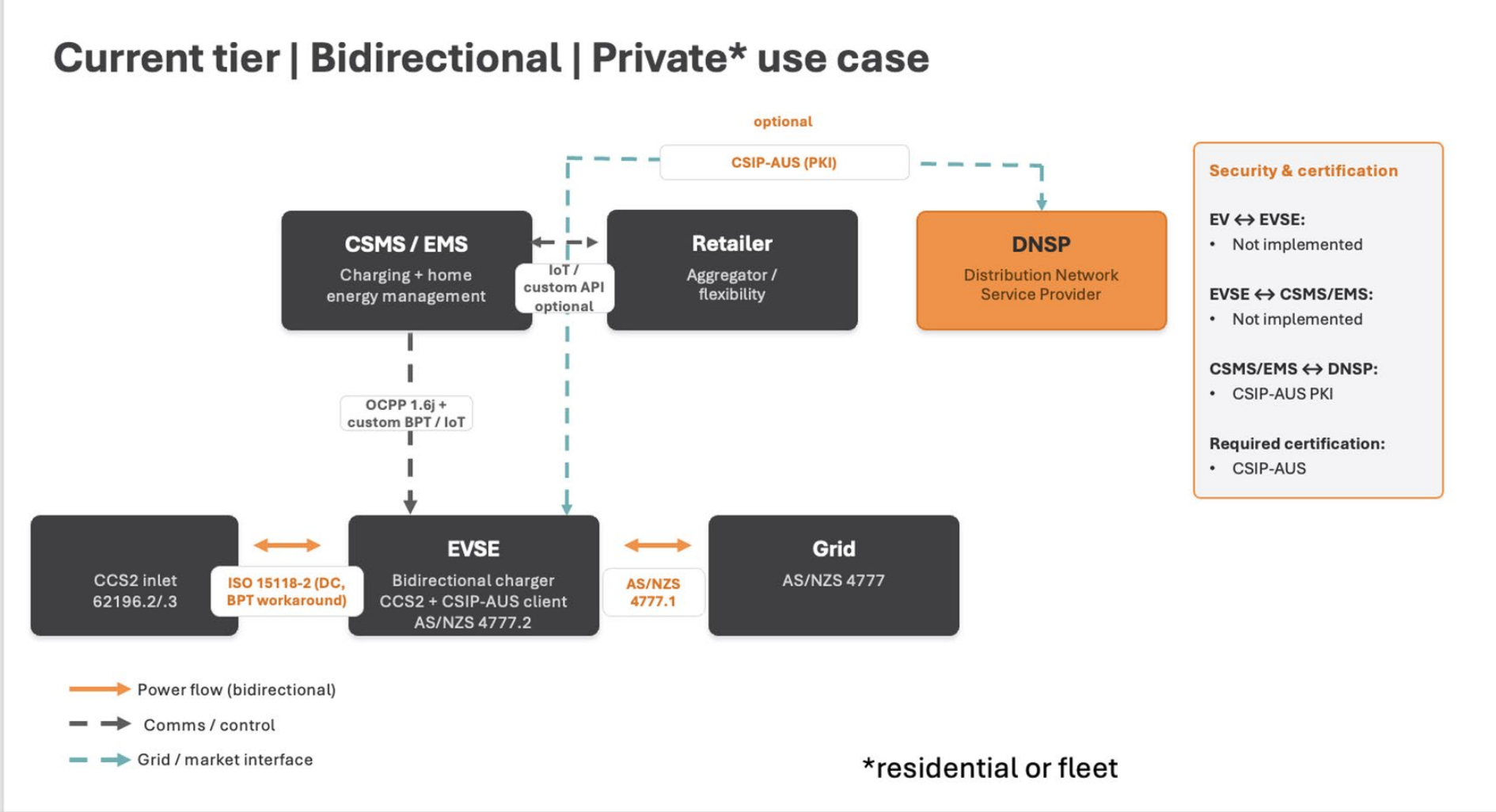
Understanding the implementation pathway

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		Use case	EV	EVSE	Power conversion to grid	CSMS / EMS	Retailer	Security	DSO	Required certifications
Current (2026)	Unidirectional	Residential	61851-1 (AC comms) DIN SPEC 70121 (DC comms) AS/NZS IEC 62196.2 AS/NZS IEC 62196.3 (CCS2 inlet)	OCPP 1.6J / adhoc / IoT protocols 61851-1 (AC comms) AS/NZS IEC 62196.2	N/A	OCPP 1.6J / adhoc / IoT protocols	N/A	EV-EVSE: No implemented EVSE-CSMS/EMS: Not implemented CSMS/EMS-DSO: N/A	N/A	N/A
		Workplace		OCPP 1.6J / adhoc / IoT protocols 61851-1 (AC comms) DIN SPEC 70121 (DC comms) AS/NZS IEC 62196.2 AS/NZS IEC 62196.3 (CCS2 inlet)		OCPP 1.6J / adhoc / IoT protocols OCPI client	OCPI Custom APIs			
		Destination		OCPP 1.6J 61851-1 (AC comms) DIN SPEC 70121 (DC comms) AS/NZS IEC 62196.2 AS/NZS IEC 62196.3 (CCS2 inlet)						
		DC-Fast		OCPP 1.6J 61851-1 (AC comms) DIN SPEC 70121 (DC comms) AS/NZS IEC 62196.3 (CCS2 plug)		OCPP 1.6J OCPI client				
	Bidirectional	Residential	61851-1 (AC comms) ISO 15118-2 with custom BPT extensions or workarounds (DC comms) AS/NZS IEC 62196.2 AS/NZS IEC 62196.3 (CCS2 inlet)	OCPP 2.0.1 with custom extensions for BPT (w/Advanced Security, Smart Charging, ISO 15118 support) or IoT protcols 61851-1 (AC comms) AS/NZS IEC 62196.3 (CCS2 plug) CSIP-AUS client	AS/NZS 4777.1:2024 AS/NZS 4777.2:2020-AMD2	OCPP 2.0.1 with custom extensions for BPT (w/Advanced Security, Smart Charging, ISO 15118 support) or IoT protcols	N/A, or IoT protocols over WAN	EV-EVSE: Not implemented EVSE-CSMS/EMS: Not implemented CSMS/EMS-DSO: CSIP-AUS PKI	CSIP-AUS per MSL functionality	CSIP-AUS
		Workplace	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Destination								
		DC-Fast								

Current reference architecture

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Gaps to close between current & target states

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Area	Current state	Target state	Gap to close
Trust framework	No shared EV PKI; OEM roots in the transitional state	Market-wide EV PKI with a neutral V2G root or cross-certification	Market-wide trust framework, including governance, certificate pools and cross-certification arrangements
EV to EVSE	IEC 61851-1, DIN SPEC 70121, ISO 15118-2 with bespoke extensions	ISO 15118-20 with Amendment 1; AC-DER-IEC for on-board inverters	Adoption of ISO 15118-20 and Amendment 1 by vehicle and charging station manufacturers
AC bidirectional certification	Formally permitted but not demonstrated; pairwise certification likely	Separate certification of vehicle and charging station	Guidance on separate certification of AC charging stations and vehicles capable of reverse power transfer using AC-DER-IEC payloads
EVSE to CSMS	OCPP 1.6J or 2.0.1 with custom extensions, or proprietary IoT; no certification	Certified OCPP 2.1 with security and DER modules	Product certification, firmware upgrades and procurement requirements
CSMS to retailer	Bilateral bespoke APIs; no residential interface	OCPI	Industry adoption and an Australian approach to testing
DNSP integration	Limited CSIP-AUS products supporting OCPP or charging station control	CSIP-AUS integrated with OCPP 2.1 across all contexts	Wider product availability and certification of integrated solutions
Security	Largely absent below the DSO interface	Mandatory at every interface	Security baselines, procurement requirements and possibly regulation
Assurance	No interoperability testing or certification regime	Conformance and field testing at every interface	Australian testing, certification and audit arrangements

Why Europe?

Europe is the de facto reference market for the CCS2 ecosystem

- ISO 15118, OCPP and Plug & Charge ecosystem
- Direct participation from global vehicle and charging manufacturers
- Established roaming, identity and certificate infrastructure
- Mature conformance laboratories, Testivals and Plugfests
- Institutions that develop, interpret, test and maintain standards

Leading markets built the foundations first

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Leading markets

1 Mandates and incentives for protocol and standards currency. Testing, certification and industry uplift.

2 Common IDs, backends, authentication, trusted data, roles, testing

3 Smart charging, Plug & Charge, Roaming

4Bidirectional, on an interoperable base

Australia today

Separate provider systems; no national roaming, interoperability requirements or testing framework

Still fragmented: software skills · device identity and PKI · conformance testing · transport–energy roles

CCS2 EU	ISO 15118 EU	OCPP (EU)	AS/NZS 4777 (AU)	CSIP-AUS on IEEE 2030.5:2018 (AUS on US)

What we did & who we met

SEPTEMBER 2026

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PURPOSE

- Bridge global practice and domestic capability
- Understand European approaches to interoperability, EV PKI, policy & regulation for vehicle-grid integration
- Conformance, testing, homologation and certification
- Workforce and institutional capability
- Observe Plugfest Europe
- Identify collaboration opportunities

WHO WE MET, IN ORDER



GERMANY
FRANCE
BELGIUM
NETHERLANDS
IRELAND

INSIGHT #1

Australia and Europe: two sides of the same coin

Europe has stronger foundations

Institutional capability: EU Commission, ElaadNL, OCA and accredited test labs
Industry: the manufacturing base have established relationships reinforced by industrial policy
Regulation created direction: sequenced infrastructure development - driven by interoperability and sovereignty

Still missing: a clear V2G value proposition

Australia has stronger market pull

Value: high DER uptake, with 4M+ rooftop systems, 500k+ home batteries, 500k+ EVs
Market: potentially volatile wholesale electricity prices
Consumers: Engaged and energy literate consumer base

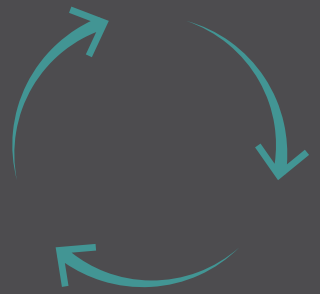
Still missing: a sequenced, directional approach

INSIGHT #2

Standards and protocols are a starting point, not the destination

Define standards

versions | profiles | translation



Test to prove implementation

conformace | compatibility | validation | interoperability

Stewardship via ongoing governance

institutional ownership | transparent evidence | accountability

INSIGHT #3

Evidence needs a route to decisions

Europe's model distributes responsibility across institutions with the mandate, capability and resources to maintain each function.

For Australia, the question is not only *what pathway should we choose?* It is also:

- Who owns technical direction?
- Who maintains profiles and implementation guidance?
- Who operates trust and identity?
- Who validates performance and responds when problems emerge?
- How does evidence reach regulation, funding and procurement decisions?

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For Australia, it means if we can get the foundations right, we can lead globally