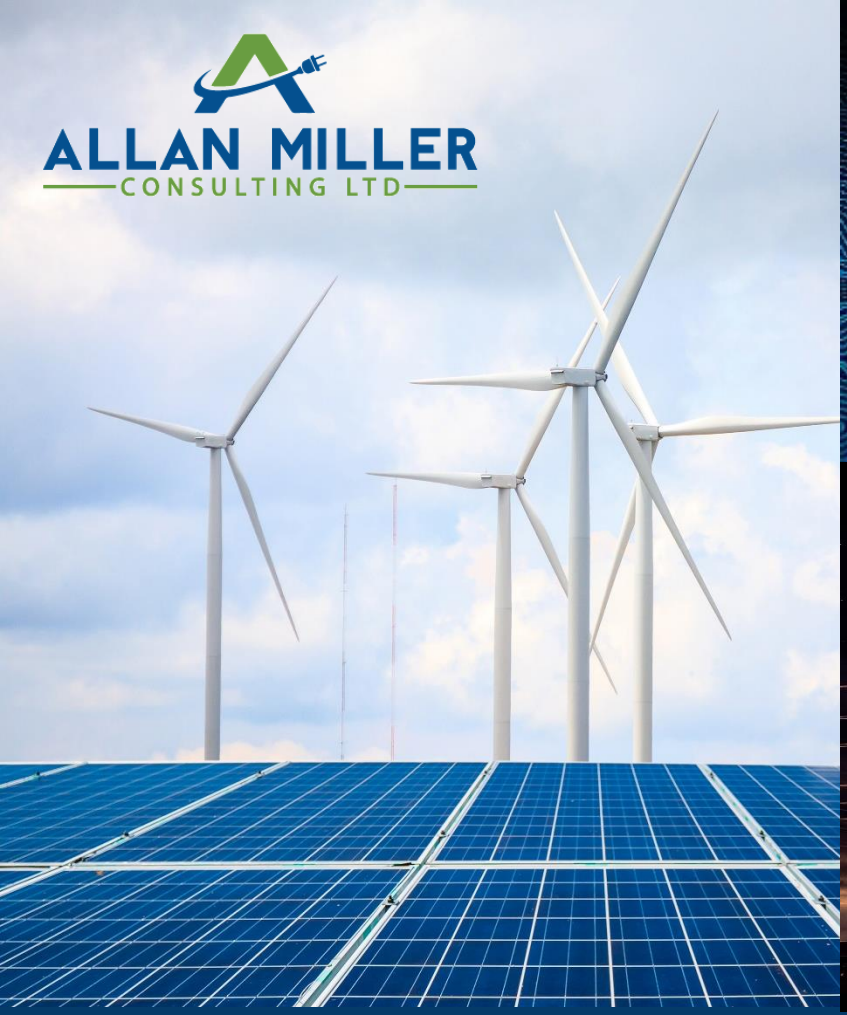
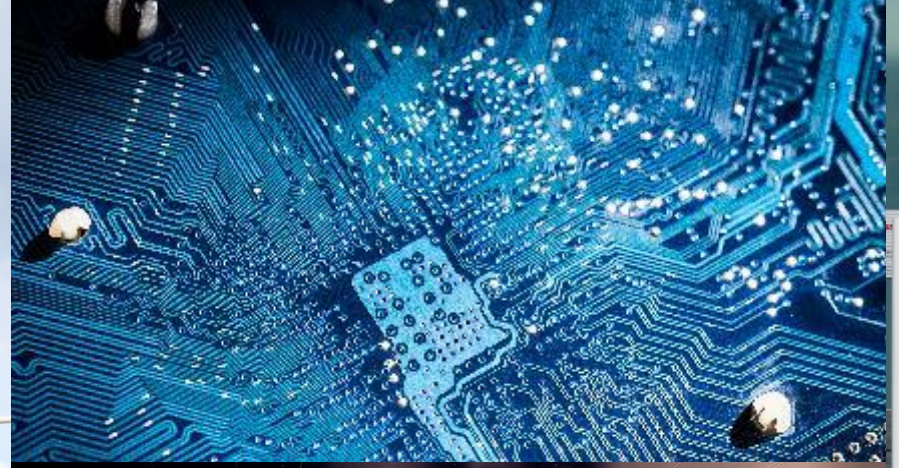



Why we need Standards

Allan Miller

Open Networks – Standards Forum

5-8-2020

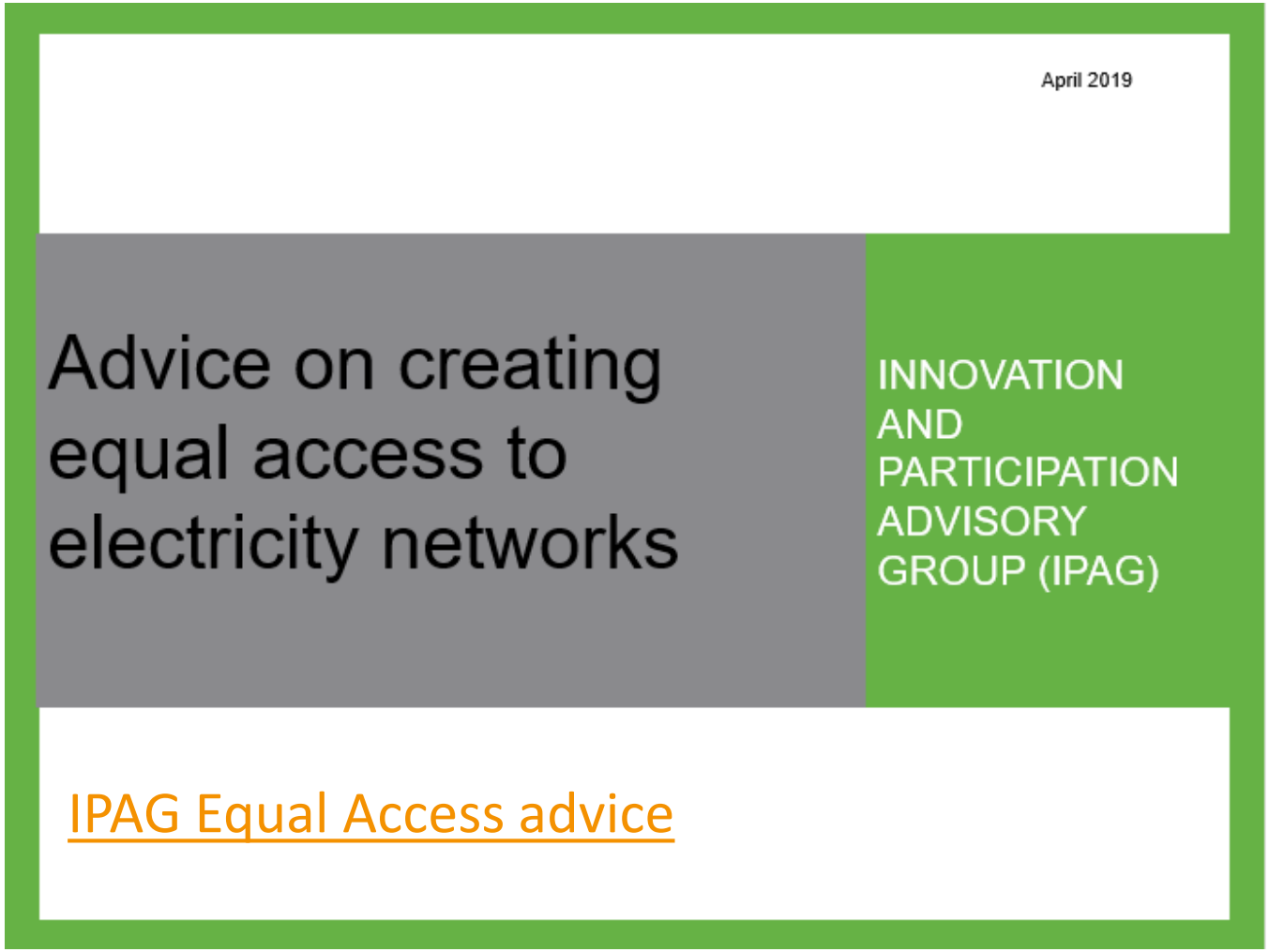
Examples

(1) Application to connect PV and export > 20 kW

(2) Information provision by distributors

DERs are connecting to a common network and may impact the quality of supply to other consumers and/or safety. For these reasons alone distributors must insist on DER equipment meeting standards. In its Equal Access Advice the IPAG argued for a common DER Connection and Operation Standard and Connection Information Pack across all distributors. These slides explain why and what the IPAG means by standards.

DER: Distributed Energy Resource, which includes but is not limited to photovoltaic solar power (PV), electric vehicles (EVs) and storage batteries



Equal Access Problem Statements

1. Key network information is not collected and/or made available to DER providers
2. Providers and procurers of DER can't see DER "market" information
3. Technical specifications are not consistent or in some cases adhered to
4. Transaction costs for facilitating DER trade are high
5. Distribution pricing does not signal the cost of DER to network operation (congestion and voltage excursions for example) or its value to distributors
6. Distributors are not confident DER can assist with service quality or is viable as a network alternative
7. Part 4 Incentives appear to be poorly understood
8. Distributors' DER investments are treated as regulated capital, but the planning and operating services provided are contestable
9. Distributors may misallocate costs and revenues
10. Distributors may favour in-house or related-party solutions
11. Distributors may favour network solutions
12. Distributors may restrict technologies or network users
13. Security and reliability at risk if DER use by transmission and distribution in conflict.

Equal Access Recommendations

3. Common technical specifications must be clear and consistent for the use of DER to develop

    3.1 Have a common code for DER connection across all networks.

    3.2 Standards for DER to ensure their connection will not cause network issues, including safety concerns.

    3.3 Distributors to develop an industry standard connection information pack.

    3.4 Industry to develop common protocols for deployment of DER for any purpose across any network.

4. Reduced transaction costs to ease trade between procurers (especially distributors) and DER providers

Why did IPAG recommend standards?

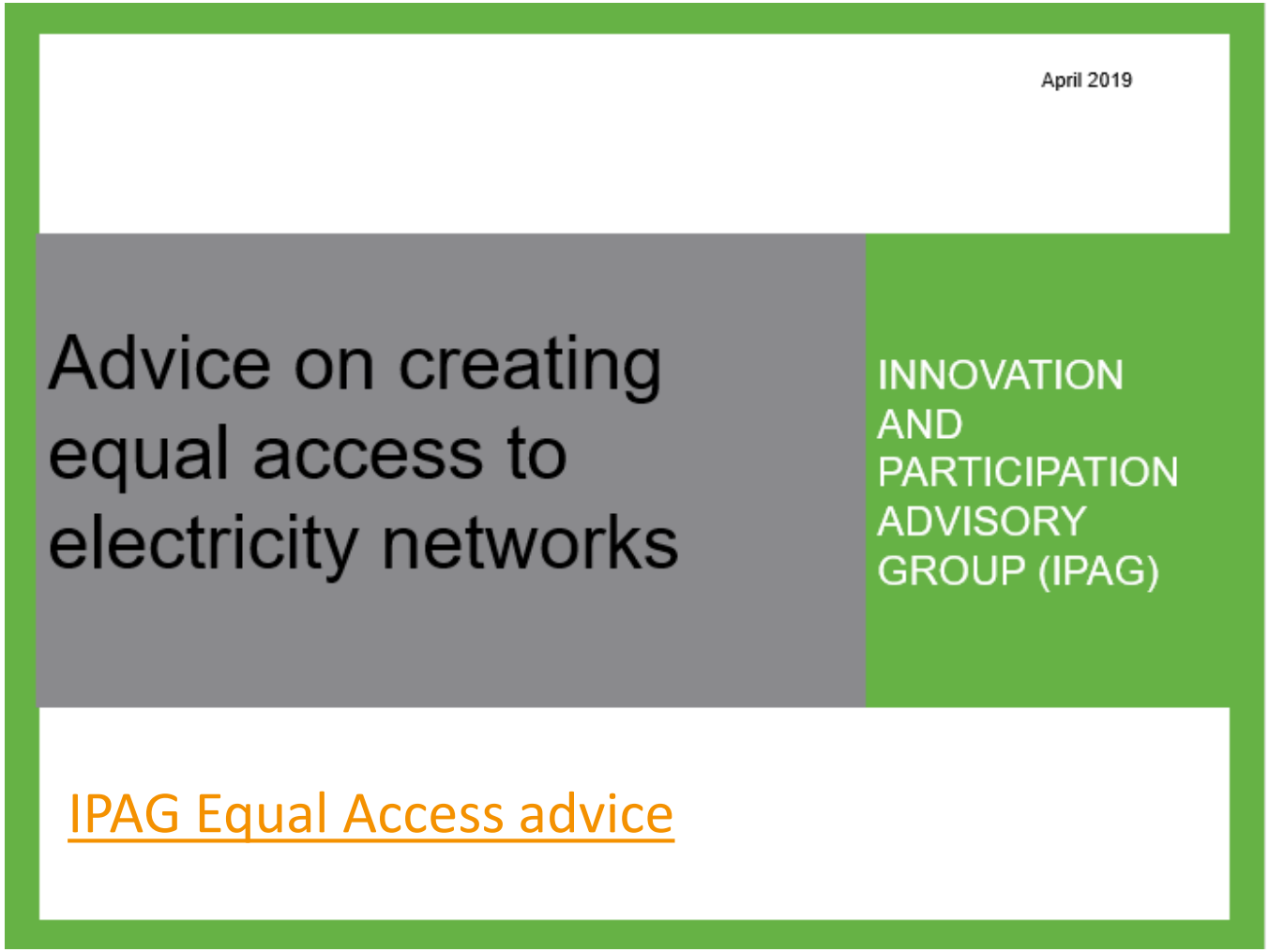
- Recognised that DERs are needed to reduce greenhouse gas emissions
- Recognised that DER installation is going to increase
- Consistency across networks for national installers and consumers
- Maximise the DER potential while minimising congestion
- Lead to ways to gain non-network support from DERs
- Reduce ambiguities, transaction costs and undesirable outcomes for:
  - installers, consumers and distributors

What did IPAG mean by standards?

- Connection and Operation Standards
  - DER connection codes to support open networks
  - Jointly determined by EDBs
  - Consistent in content and implementation across EDBs
- Appliance and equipment standards
  - Expected to be referred to / required by Connection and Operation Standards
- Specific safety standards
- Consistent implementation of standards or guides across EDBs
- Applies to *all* DERs, also to large-scale DG

Related Issues

- Pace of change of technology is high
  - Need to move fast in developing and adopting standards
  - Need to evolve standards
- DERs are not standing still
  - Expect acceleration of growth
- Standards are needed to ensure supply quality & safety
- DER connection standards
  - An important component of meeting climate change goals



Observations:

- It is not always possible to simply make decisions on one feeder based on what happens on another
- Congestion from PV and EVs can often be mitigated → using the DERs themselves!
- Mitigation only goes so far; very high penetrations of PV or EVs may still cause congestion
- PV and EV hosting capacities are determined by different factors
- Understanding hosting capacity gives a factual basis from which to make decisions, with a standard setting out the basis of the decisions
- A standard way of dealing with PV and EV connection:
  - Avoids individual approaches → consistency across networks for national installers and consumers
  - Supports network engineers tasked with assessing DER connections, some of which are challenging
  - Supports EDBs responsible for supply quality
  - Supports the adoption of low carbon technology (connected to the grid) and ultimately net zero New Zealand