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Distributed Generation Low Voltage Workshop

22 January 2020

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Agenda

Lunch & Networking 11:30 – 12:15pm

Welcome & Introduction	ICE 2019-20 Update	Shaping our 2020-21 ICE Workplan	Transition to DSO	Flexible Services	Ofgem Significant Code Review Update
	EREC G98 & G99	Your Post Acceptance Journey	Question & Answer Session	Wrap Up & Close	

Meet the Team

Mark Williamson

Energy Solutions Director

Mark is a chartered engineer with over 30 years experience in the electricity supply industry. He is responsible for all new connections to the Electricity North West network in the North West of England. In addition, via our ENWL Construction and Maintenance Ltd division provides control, operation, maintenance and construction services for customer's with private high and low voltage networks.

Hannah Sharratt

Connections Stakeholder Engagement and Regulation Manager

Hannah has over 20 years experience in the Utility industry, mostly in programme and project management roles. Hannah's current role focuses on our Connections stakeholder engagement

Keith Evans

Smart Grid Engineer

Keith has recently taken over as the DSO Transition and Smart Grid Engineering Manager. Through this role he is responsible for guiding the business into becoming a Distribution System Operator, which is a key element of ENWs vision of leading the North West to becoming a net Zero Carbon economy.

Meet the Team

Brian Hoy

Head of Market Regulation

Brian has over 30 years of experience working in the electricity industry. He has an engineering background but has worked in the regulatory aspects of new connections for a number of years. Brian represents Electricity North West on connections related matters and leads a number of national industry groups.

Matt Savka

Connections Delivery Manager

Matt has worked at Electricity North West for over 14 years, during which he has held various roles within Connections from Design Engineer to Business Connections Manager.
Matt's current focus is on design for demand and generation connections in the south of our region.

Gillian Williamson

HV Planning Manager

Gill's role in Strategic Planning includes managing the team responsible for HV connections, providing technical support to our customers from identification of least cost points of connection through post acceptance including protection reviews, fault level studies, power quality assessments and earthing.

Meet the Team

Steffan Jones

Infrastructure Solutions Manager

Steffan joined Electricity North West in 2014 as the Infrastructure Solutions Manager, heading up both the Grid and Primary Connections team and the Asset Diversions team. During his 24 year career he has worked in both heavy industry and commercial contracting roles as well as the electrical utility sector. Steffan looks to bring this experience to enhance the customer journey through out the

Chris Thompson

Connections Engineer

Chris has over 21 years of experience in the electrical distribution industry and currently works as a Design Engineer in the Business Connections team based in Carlisle. His role involves design and costing of new electricity networks to facilitate new demand and generation connections, including review and approval of G99 commissioning documents once connected to the network.

Dominic Allan

Design Technician

Dominic works for the Business connections team, containing High Voltage, Low Voltage and Generation engineers providing new connections to customers. Dominic is a design technician undertaking generation and demand projects. The role of the team is to provide new connections to customers in the most efficient, best suited way possible.

What do we want from you today?

- One word – **Feedback!**
- Use the feedback forms and give us your honest opinion
- Contact me, the ICE team or your usual contacts in ENWL at any time to give us feedback
- Mark.Williamson@enwl.co.uk
- ice@enwl.co.uk

Domestic Arrangements

- Don’t forget to sign in!
- No Fire Alarms planned
- Emergency Assembly Point
- WCs
- Mobile Phones

Incentive on Connection Engagement (ICE) 2019-20 Update

Hannah Sharratt

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ICE 2019-20 Workplan Performance

➢ Communicate new requirements for EREC G98 & G99 to our stakeholders, with a minimum of 3 events.	✓ 2 webinars hosted and available on our website ✓ 2 presentations at our workshops.
➢ Engage with stakeholders on our transition to Distribution System Operator (DSO) Strategy	✓ Presentation at Low Voltage Generation workshops describing our DSO Strategy and the elements within.
➢ Engage with stakeholders on the flexible services we offer, presenting at a minimum of 2 workshops.	✓ Consultation completed. 2 workshop presentations provided.
➢ Brief stakeholders on proposed changes to charges in Ofgem's Significant Code Review.	✓ Presented at 2 workshops and 1 webinar, with a further webinar planned.
➢ Engage with stakeholders on any changes to our approach to A&D fees.	✓ Update provided at workshop. No changes to current approach planned.
➢ Engage with stakeholders to review and improve the post acceptance process.	✓ Stakeholder discussion held in 1st workshop, proposals discussed at 2nd workshop. On track to deliver.
➢ Set up Expert Panel specifically for our DG LV customers & host a minimum of 2 calls.	✓ 1 call hosted, 1 more planned this year.
➢ Provide a high level of customer service, with the target of an overall satisfaction score of 85%.	○ Low response rate.

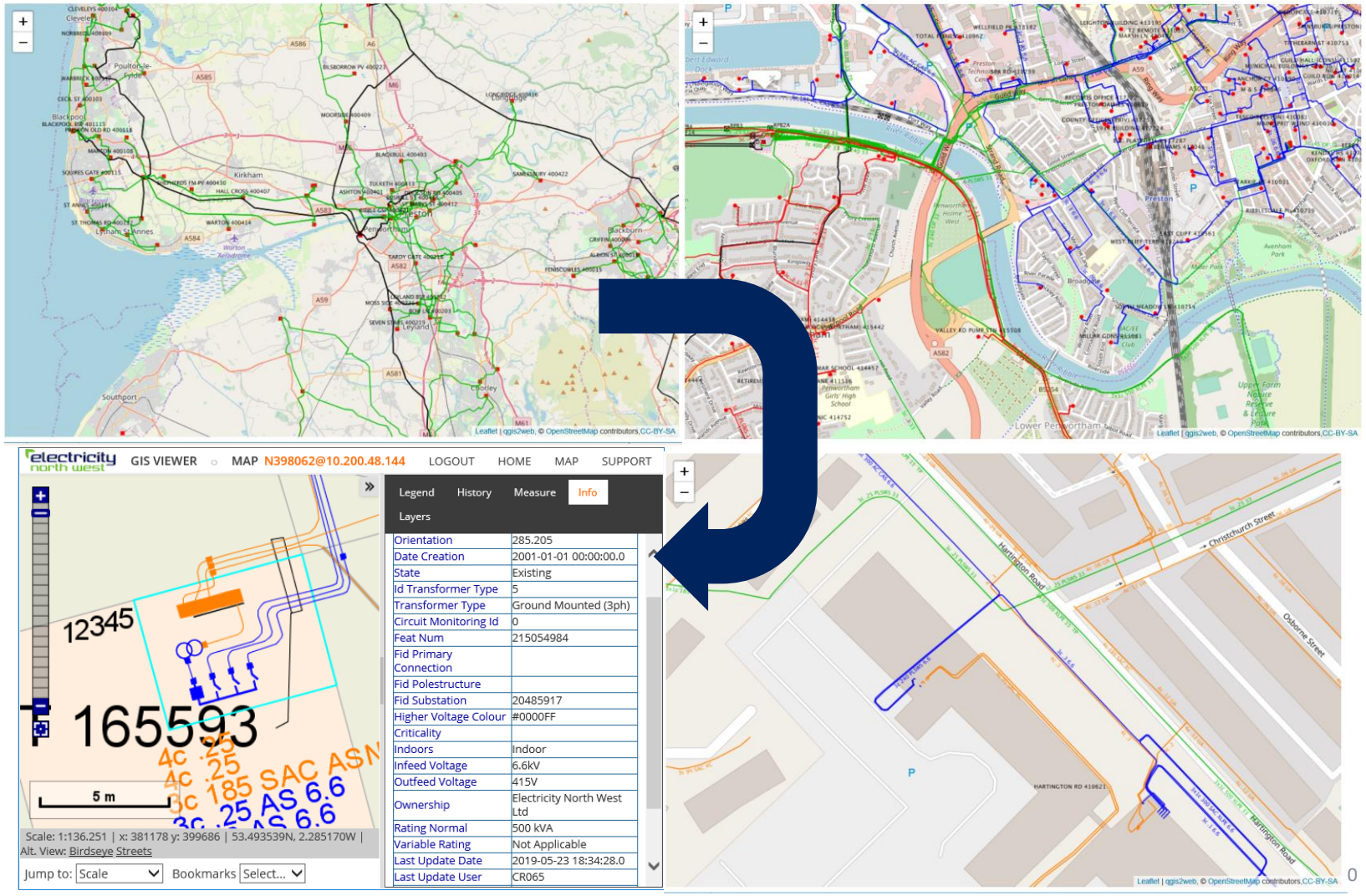
GIS Update

➢ Improve access to Network Information in our Geographical Information System (GIS)

○ Project in flight. Testing to commence in final quarter, with full delivery early next year.

Proposed

- Web based application
- Better access arrangements – 24/7
- Update period more frequent – improved time delay from site data appearing in GIS system
- Simple Browser or Download for your own GIS software
- More information displayed on asset attributes



NMS Update

➢ Engage with stakeholders on the impact of our new Network Management System (NMS), reviewing the process for pre-construction drawings and communicate any changes

○ Full implementation of our new NMS deferred to April. Presented updates at 2 workshops – **no impact or change to DG LV customers**.

Control Room Management System (CRMS)

Network Management System (NMS)

Go Live Date: April 2020

Potential impact 1: Provision of ‘Pre-built’ drawings

Potential impact 2: Booking outage in advance

Potential impact 3: Inform Control Room at energisation

Result: NO IMPACT FOR DG LV CUSTOMERS

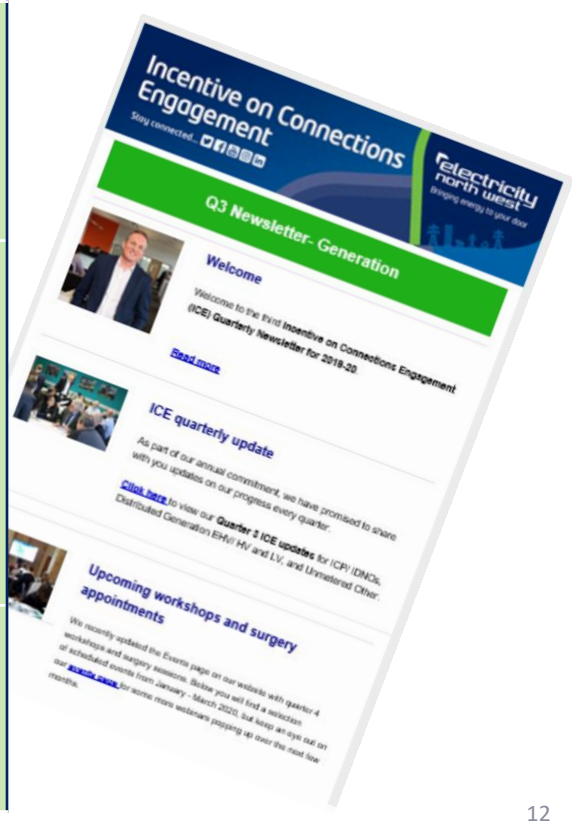
NMS
Our new Network Management System is purpose built to cater for future network requirements

ICE 2019-20 Workplan Performance

➢ Outperform the regulatory standard of 45 working days, by providing quotes within an average of **28 working days**.	✓ Achieved an average of **23 working days** to provide quotes for our LV generation customers.

- Business As Usual commitments

➢ Engage with Community and Local Energy Stakeholders, including 4 engagement events.	✓Committed to **4 Community Energy** workshops. 3 completed, 1 planned
➢ Offer 5 workshops / surgery sessions for our Low Voltage Distributed Generation customers.	✓ **4 surgery sessions** offered to our LV generation customers. ✓ **2 workshops** hosted for our LV generation stakeholders. ✓ Multiple webinars offered to our LV generation stakeholders.
➢ Provide quarterly updates on our progress.	✓ Quarterly updates and newsletters published for ICE and for Community Energy.



Shaping our 2020-21 ICE Workplan

Hannah Sharratt

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What will we cover today

Seek feedback from you on what is important and what we can put in place to improve our services to you

Explain
our process for ICE

Understand your priorities

Discuss and prioritise potential commitments

2019-20 DG LV ICE Workplan Development

Gather Ideas & Options:	Assessment & Benefits Review:	Assessment & Benefits Review:	Confirm:	Finalise
Draft ICE commitments & actions (Dec / Jan)	Test draft ICE actions with stakeholders (Jan / Feb)	Review & respond to feedback (Feb / Mar)	Test updated ICE actions & KPIs / outputs with stakeholders (Mar)	Publish Workplan (Apr)
Internal engagement	External engagement	Act on feedback	External engagement	Finalise & Issue

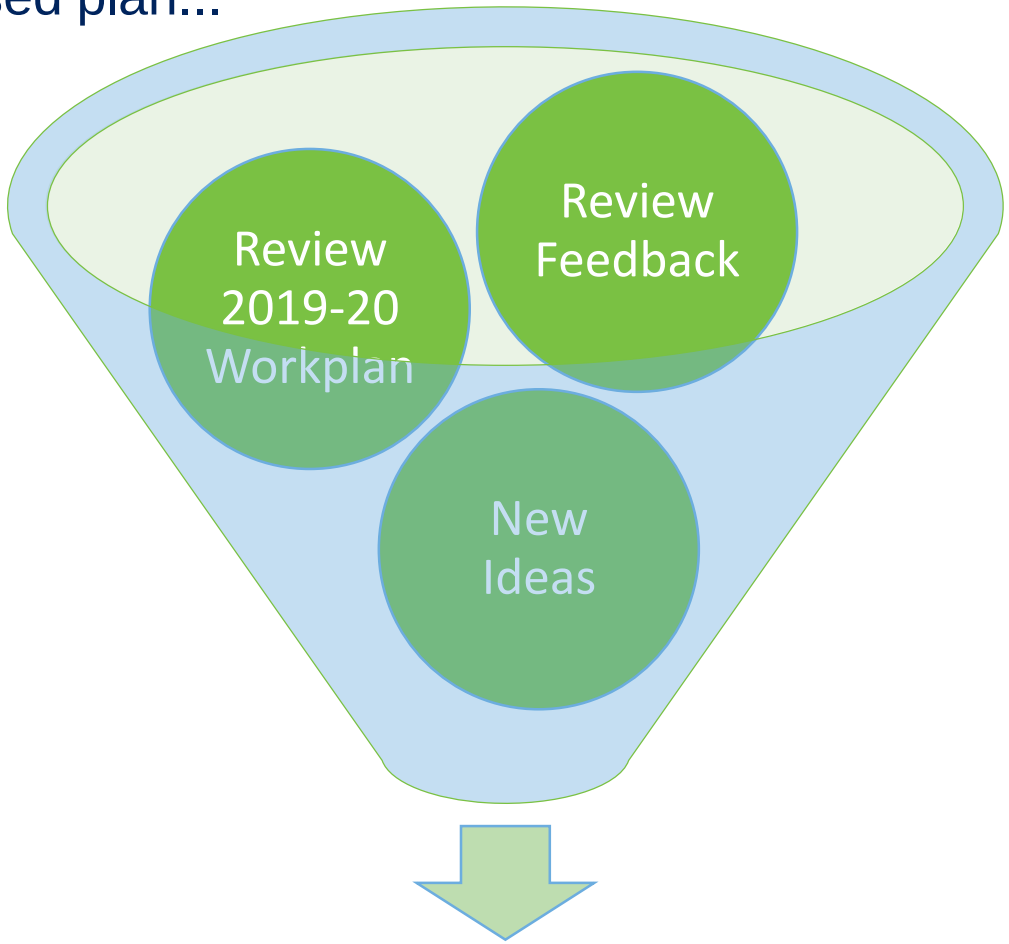
Your Priorities ?

- For each of the following topics, please indicate the level of importance to you
  - 1 = low importance, 5 = extremely important

Competition in Connections	Training & Guidance	Clarity of Customer Responsibilities
Process	Time To Quote	Communication
Land Rights & Consents	Time To Connect	Ease of application
Cost	Pre-application support	Payment Options
Interactivity	Access to Information	A&D Fees
Flexible Connection Options	Clarity of our Requirements	Other factors, eg Highways, National Rail, BEIS

Proposed DG LV Workplan

How we create the proposed plan...



Draft 2020-21 ICE Workplan

ICE Commitments League – Ranking exercise

- **Individual activity:** Using the sheets provided, please categorise each proposed ICE commitment.
- **Group activity:** Using the cards provided, please categorise each proposed ICE commitment.
- Please also provide feedback on our proposed actions, and describe how this will benefit you.

		Team	Played	Won	Drawn	Lost	For	Against	GD	Points	Form
1	—	Liverpool	21	20	1	0	50	14	36	61	W W W W W
2	—	Manchester City	22	15	2	5	62	25	37	47	W L W W W
3	—	Leicester City	22	14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	45	L L W W L
4	—	Chelsea	22	12	3	7	39	29	10	39	W L W D W
5	—	Manchester United	22	9	7	6	36	25	11	34	L W W L W
6	—	Sheffield United	22	8	8	6	24	21	3	32	W D L L W
7	—	Wolverhampton Wanderers	22	7	10	5	31	28	3	31	W W L L D
8	—	Tottenham Hotspur	22	8	6	8	36	31	5	30	L W D L L
9	—	Crystal Palace	22	7	8	7	20	24	-4	29	L W D D D
10	—	Arsenal	22	6	10	6	29	31	-2	28	D D L W D
11	—	Everton	22	8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28	D W W L W
12	—	Southampton	22	8	4	10	27	39	-12	28	W W D W W
13	—	Newcastle United	22	7	5	10	21	34	-13	26	W L L L D
14	—	Brighton & Hove Albion	22	6	6	10	25	30	-5	24	L L W D L
15	—	Burnley	22	7	3	12	24	37	-13	24	W L L L L
16	—	West Ham United	21	6	4	11	25	33	-8	22	W L L W L
17	—	Watford	22	5	7	10	20	34	-14	22	W D W W W
18	—	Aston Villa	22	6	3	13	28	43	-15	21	L W L W L
19	—	AFC Bournemouth	22	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20	L D L L L
20	—	Norwich City	22	3	5	14	22	45	-23	14	L L D D L

Into Europe

Mid Table

Relegation Zone

Last updated 16th January 2020 at 17:16

Feedback & Summary

Thank you

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DSO Transition

Keith Evans

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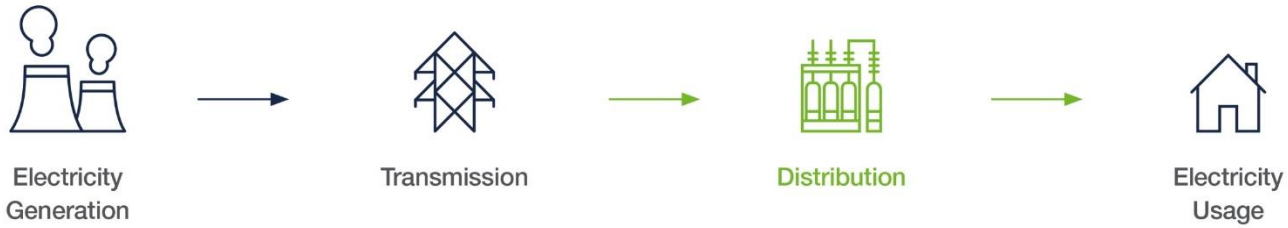
Increasing network complexity

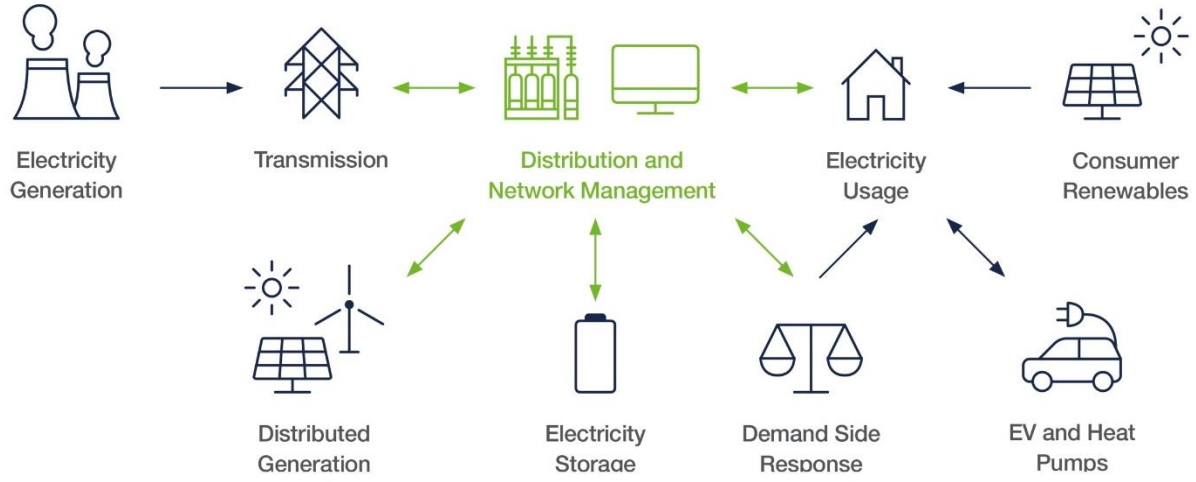
Historically controlling single directional flows

- 18 connections to National Grid transmission network.
- 6 connections to other DNOs



As a DSO controlling bi directional flows

- 18 connections to National Grid transmission network.
- 6 connections to other DNOs
- Hundreds of connections to IDNOs
- Tens of thousands of customer connections



Distribution System Operation

- A large quantity of the ICE and business change program plans for 2018 & 2019 have been associated with the transition to enhancement of Distribution System Operation functionality within ENWL.

- Distribution System Operation can be segregated into a range of functions, some are inherently the responsibility of the DNO to deliver, however many are already widely open to competition and market participation.

- Some of the DSO functions were already part of the role of a DNO and will be enhanced, whilst some are completely new.

- We believe that DNOs should retain responsibility for all DSO functions which preserve the system security and are directly liked to the licence obligation of:

  "Permit the development, maintenance, and operation of an efficient, co-ordinated, and economical system for the distribution of electricity;" (licence condition 21)

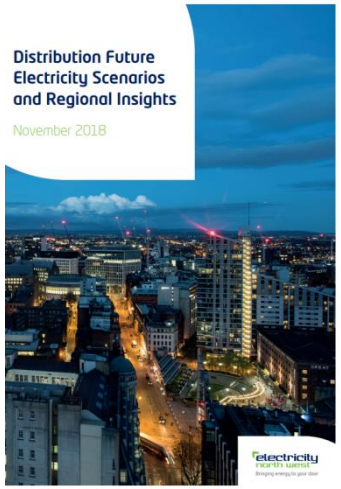
Benefits of DSO transition

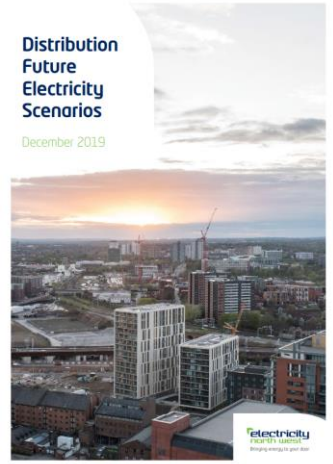
Improved customer experience	• Improved customer experience though sharing of best practice within the ENA Open Networks project
Efficiency savings	• Increase utilisation of networks assets allowing for efficiency savings
Whole system investment	• Improved whole system investment decisions through closer working relationships with other network providers
Low carbon economy	• Facilitating the transition to a low carbon economy.
Increased flexibility	• Allowing all customers the ability, independent of size, to participate in energy trading and balancing
Increased productivity	• Increased productivity as a result of developing new modelling tools, implementing new systems, and improved automation

What have we done to date

Distribution Future Electricity Scenarios Documents

- 2 years of DFES publications
- 2019 FES includes data workbook
  https://www.enwl.co.uk/get-connected/network-information/dfes/

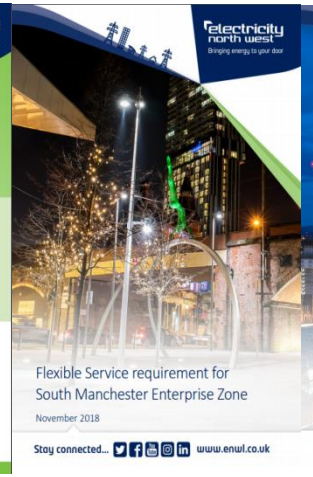


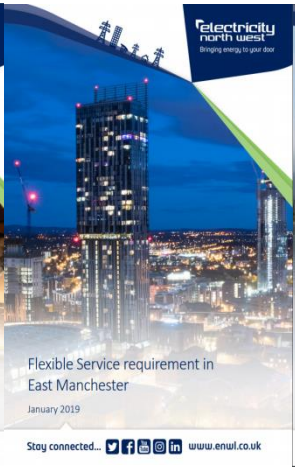


Requests of Flexible Services

- 14 Requirements published
- 5 Tenders undertaken
- 52MW asked for

https://www.enwl.co.uk/get-connected/network-information/flexible-services/



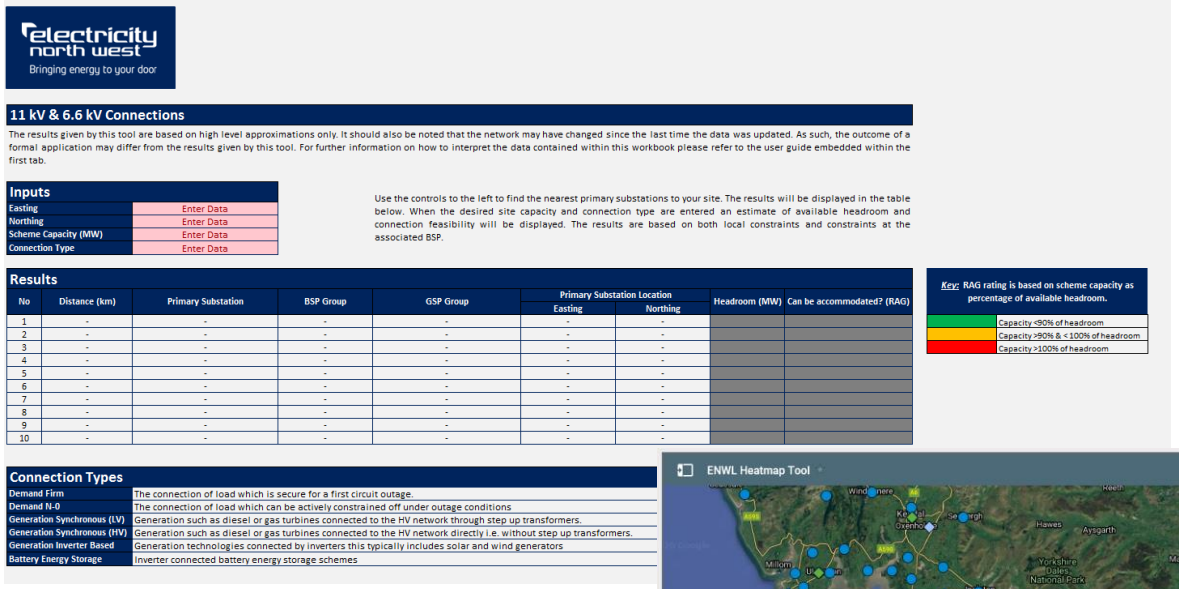


What have we done to date

Heat Mapping Tool

- In 2018 we published the new improved heat mapping tool.
- Tool is updated monthly
- Enables developers to assess the level of capacity that might be available for new connections to our network.
- New geographical functionality added

https://www.enwl.co.uk/get-connected/network-information/heatmap-tool/



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11 kV & 6.6 kV Connections

The results given by this tool are based on high level approximations only. It should also be noted that the network may have changed since the last time the data was updated. As such, the outcome of a formal application may differ from the results given by this tool. For further information on how to interpret the data contained within this workbook please refer to the user guide embedded within the first tab.

Inputs

Easting	Enter Data
Northing	Enter Data
Scheme Capacity (MW)	Enter Data
Connection Type	Enter Data

Use the controls to the left to find the nearest primary substations to your site. The results will be displayed in the table below. When the desired site capacity and connection type are entered an estimate of available headroom and connection feasibility will be displayed. The results are based on both local constraints and constraints at the associated BSP.

Results

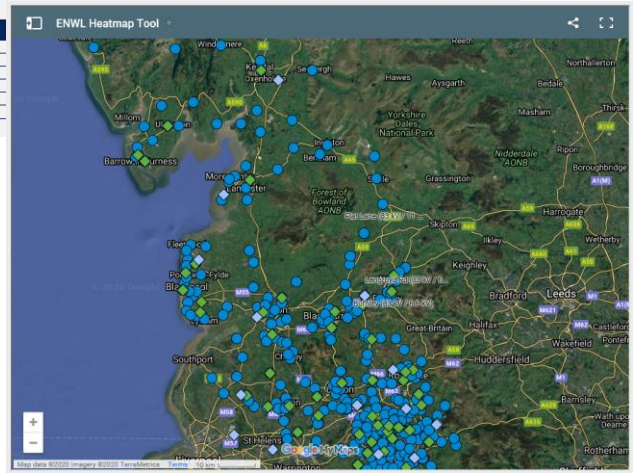
No	Distance (km)	Primary Substation	BSP Group	GSP Group	Primary Substation Location		Headroom (MW)	Can be accommodated? (RAG)
					Easting	Northing		
1	-	-	-	-	-	-		
2	-	-	-	-	-	-		
3	-	-	-	-	-	-		
4	-	-	-	-	-	-		
5	-	-	-	-	-	-		
6	-	-	-	-	-	-		
7	-	-	-	-	-	-		
8	-	-	-	-	-	-		
9	-	-	-	-	-	-		
10	-	-	-	-	-	-		

Key: RAG rating is based on scheme capacity as percentage of available headroom.

	Capacity <90% of headroom
	Capacity >90% & < 100% of headroom
	Capacity >100% of headroom

Connection Types

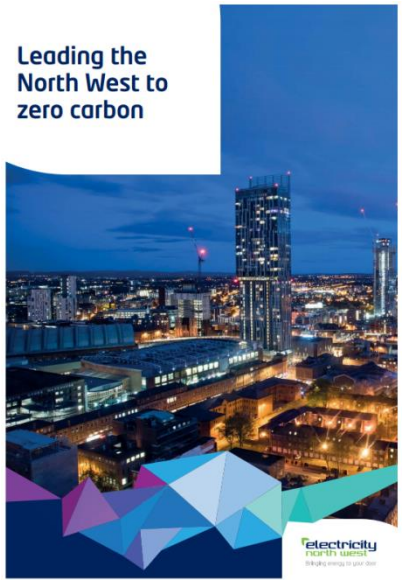
Demand Firm	The connection of load which is secure for a first circuit outage.
Demand N-0	The connection of load which can be actively constrained off under outage conditions
Generation Synchronous (LV)	Generation such as diesel or gas turbines connected to the HV network through step up transformers.
Generation Synchronous (HV)	Generation such as diesel or gas turbines connected to the HV network directly i.e. without step up transformers.
Generation Inverter Based	Generation technologies connected by inverters this typically includes solar and wind generators
Battery Energy Storage	Inverter connected battery energy storage schemes



Carbon Plan

- Publication of the carbon plan in 2019
- Maps out how we intend to reduce emissions 10% year on year.

https://www.enwl.co.uk/zero-carbon/leading-the-north-west-to-zero-carbon/

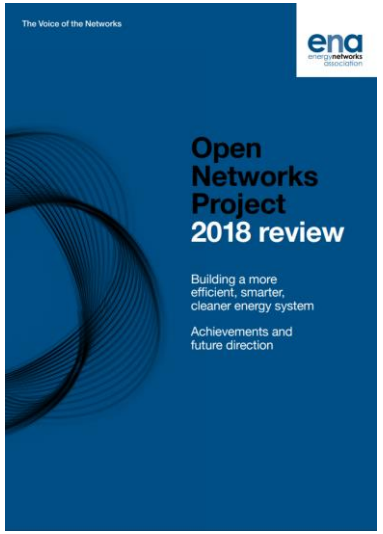


What have we done to date

Open Networks Project

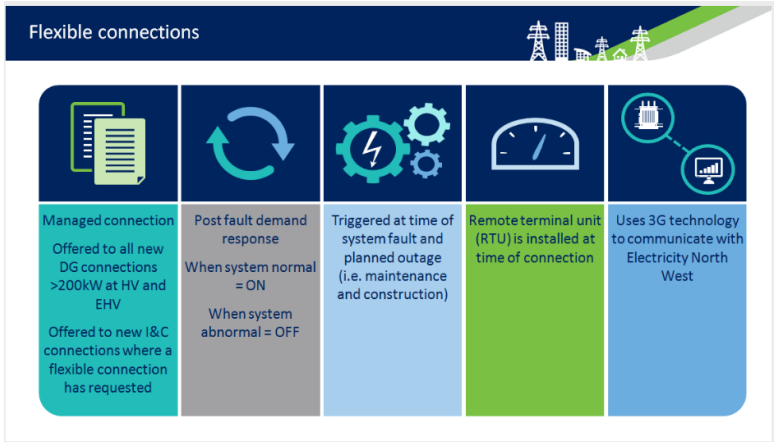
- Worked collaboratively with the other industry members to develop shared processes, identify best practices, and enhance whole system development.
- Consultations on: impact assessment, connection queues, interactivity, and flexible services.

http://www.energynetworks.org/electricity/futures/open-networks-project/



Flexible Connections

- We offer constrained or flexible connection offers as standard, which means you could benefit from avoiding reinforcement costs and associated timescales for traditional network reinforcement. https://www.enwl.co.uk/get-connected/apply-for-a-new-connection/managed-connections/



Key points for 2020

- Publication of System Wide Resource Register
- Changes to the interactivity process
- Changes to the queue management process
- Alignment of flexible services contracts with other DNOs
- Publication of Digitisation strategy

DSO transition

Current

- Flexible connections offered
- Flexibility services tendering
- DFES published
- Heat maps published

2020 – 2021

- Enhanced data sharing with ESO.
- Expansion of Flexible Connections options
- Enhanced data sharing with stakeholders
- Flexible services contracts alignment

2021 - 2023

- Active Network Management (ANM) rollout
- ANM & DER service integration
- Enhanced Integration of Smart meter data
- ED2 business plan submission

2024 - 2030

- DSO commercial operations are core business capability
- Active system management

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Flexible Services

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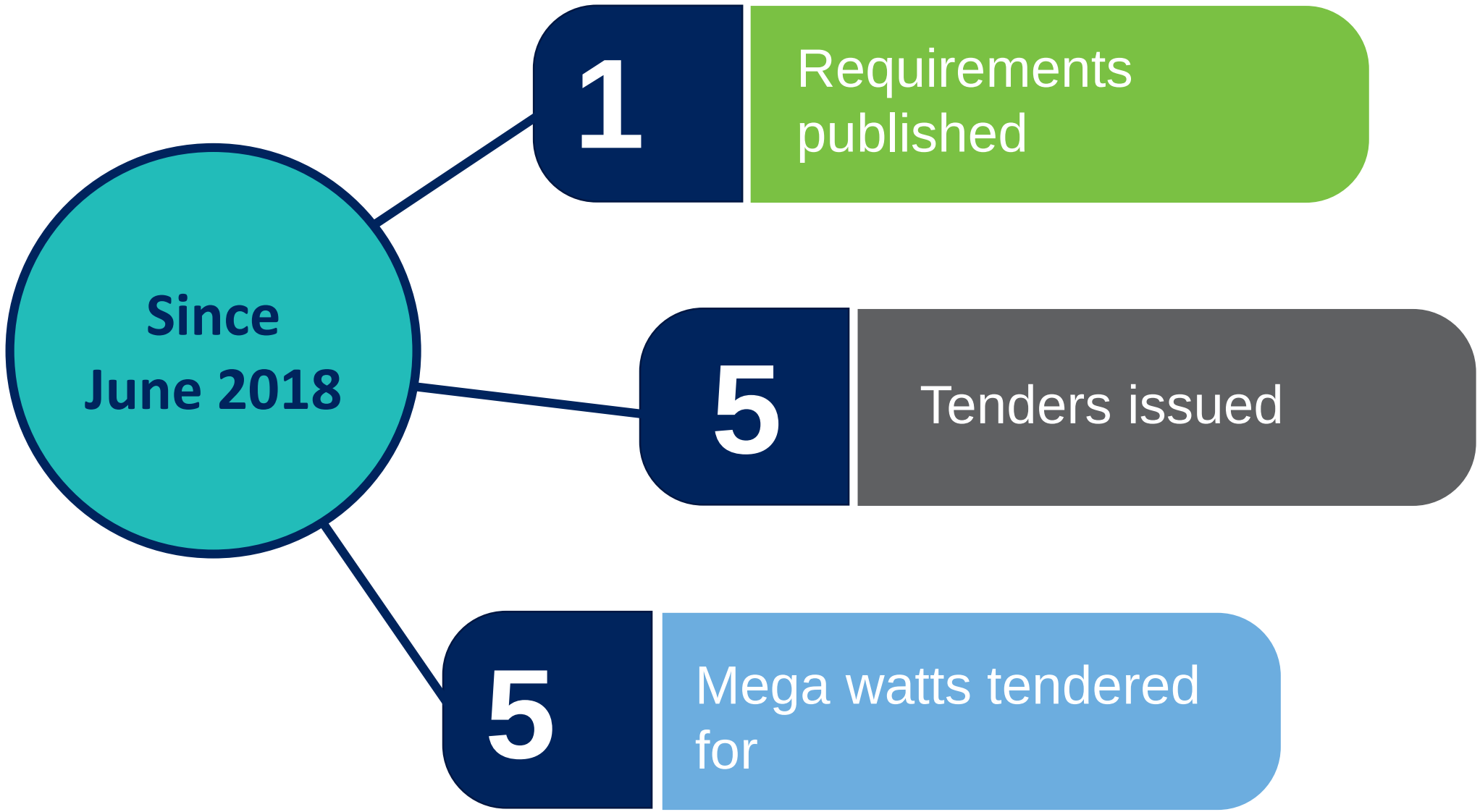
Tenders to date



Progress

You said	We did
The minimum size for participation is too high	We reduced the minimum size for directly connected customers to 50kW and aggregated resources to 100kW
The requirement for minute by minute metering is a deterrent	We changed the metering requirement to half-hourly metering
More transparency is needed with documentation	We created the addition information section on our website which includes the template contract and T&Cs
More notice is needed of future requirements	We now sign post our future requirements on our flexibility map on our website
The requirements and associated processes aren't clear	We have extended the clarification window at the beginning of each RfP going forward and have introduced bi-annual workshops

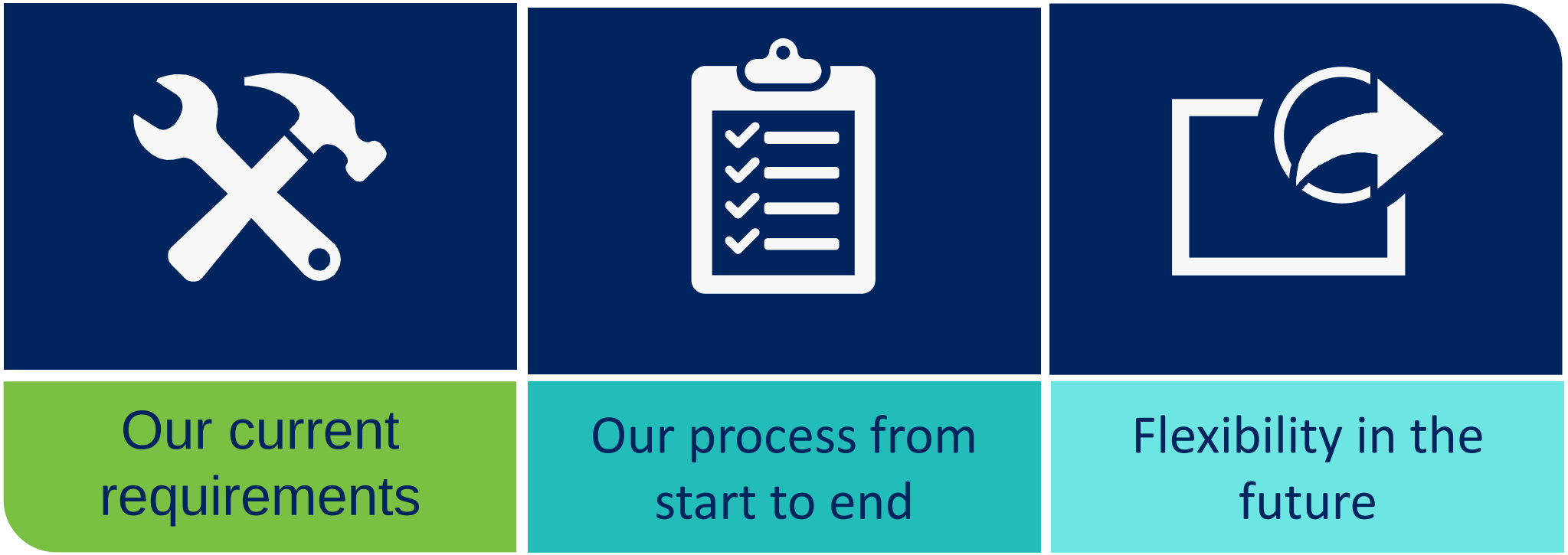
Current requirements

New requirements will be published in Spring

Deadline for submissions was on 13th December

Results of this will be published in March

November workshop



The full slide deck and summary of feedback is available at on our engagement page

Flexibility workshop – feedback

Barriers to Participation

- Geographic
- Price visibility
- Contract length
- Notice period

Additional Information

- HH load profiles
- Technical specification
- Visibility on platforms

Upcoming Workshop

12

March

The event will be held at ‘Leaf’ in Manchester city centre

09:30 – 12:30

You can register for this event through our events page

Please sign up to our distribution list to be notified of the details of this workshop and any future events

Open Networks Project

Feedback from stakeholders from the recent consultation has highlighted the need to make it easier to participate in multiple markets and across distribution network boundaries.

Open Networks are now prioritising consistency between DNO's to facilitate stakeholders and remove barriers to participation.

Good practice guide	• Agreement on level of detail of information to be provided by all DNOs • Work is ongoing and will continue next year to achieve further consistency across procurement processes and operational parameters
Consistent branding	• March 2020 all DNO's will adopt consistent branding of flexibility products • Service characteristics of each type of response will be aligned
Standard terms & conditions	• Currently producing a set of standard terms and conditions • These are to be adopted by all DNO's in March 2020

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Digital Strategy Consultation 2019

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2019 Digital Strategy – Request for feedback

To enable the decarbonisation of energy, the energy network and markets require modernisation. Our **Digital Strategy consultation 2019** describes how we are responding to this need.

Please tell us what you think

Thank you

Strategy highlights:

- Improving accessibility and insight into our data.
- Exploiting the new network management systems to streamline processes and actively manage the network. Developing solutions to support economic growth.
- Improving customer service by providing more accurate information over more channels and through more self-service.

We are committed to delivering a strategy that meets the needs of our customers and stakeholders. To do this we are developing our digital strategy with the help of our customers and stakeholders, as well as sector and technology experts.

View our "Digital Strategy Consultation" on our website here and complete the survey – Please respond by 10th February 2020

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Ofgem’s Charging Significant Code Reviews (SCR)

Brian Hoy

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Recap - What is a Significant Code Review?

- **A Significant Code Review (SCR)** allows Ofgem to initiate wide ranging and holistic change and to implement reform of a code based issue.

- The are two SCRs with regard to charging

  - The ***Access SCR*** which is looking at Access rights and 'Forward-Looking Charges'; and
  - The ***Targeted Charging Review*** (TCR) which looked at how 'residual' network charges should be set. This is now in the implementation phase

- This presentation will cover the scope and timelines of the Access SCR and the potential impacts

- We have a webinar on 6 February at 10am if you are interested in more details (register here)

What is the Access SCR?

- **Objective of Access Significant Code Review (SCR):** to ensure electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general**.**
  - **Access arrangements** - the nature of users' access to the electricity networks (for example, when users can import/export electricity and how much) and how these rights are allocated:
  - **Forward-looking charges** –the type of ongoing electricity network charges which signal to users how their actions can ether increase or decrease network costs in the future
- **Scope:**
  - Review of the definition and choice of transmission and distribution access rights
  - Wide-ranging review of Distribution Use of System (DUoS) network charges
  - Review of distribution connection charging boundary
  - Focussed review of Transmission Network Use of System (TNUoS) charges

Ofgem's approach

- Ofgem's focus this year is on developing and assessing a long-list of options. They are sharing their thinking through two working papers:
  - 1st working paper – published September 2019
    - An initial overview and assessment of options for access rights, better locational DUoS signals and charge design.
    - The links between access, charging and procurement of flexibility.
  - 2nd working paper – published December 2019
    - Distribution connection charging
    - Small user treatment
    - Focused transmission charging reforms
- A shortlist of options will be assessed in further detail this year, with consultation on their draft SCR conclusions in summer 2020

- Further information on the reviews can be found at
  - http://www.chargingfutures.com/charging-reforms/access-forward-looking-charges/proposed-changes-and-potential-impacts/
  - https://www.ofgem.gov.uk/electricity/transmission-networks/charging/reform-network-access-and-forward-looking-charges

Ofgem's Access and Forward Looking Charging SCR

1ST Working Paper – September 2019

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Reform of access rights - recap

- **Network access rights define the nature of users' access to the network and the capacity they can use** (eg how much they can import or export, when and for how long, and whether their access is to be interrupted and what happens if it is).

- It should benefit all network users if we can make better use of capacity and allocate it in a smarter way.

Potential Impacts of Access Right Changes

- **For IDNOs**
  - Will probably need to reflect arrangements in their agreements with customers
- **For ICPs**
  - Probably not significantly affected
- **For Distributed Generation and Demand Customers**
  - Potentially impact existing rights but could introduce more flexible options

Forward Looking Charges - Better Locational DUoS Charges

Treatment of EHV costs for HV/LV customers

All the way model
HV and LV connected customers are charged based on a generic allocative/ultra long-run model per DNO region, while EHV connected customers have highly locational incremental charges

HV/LV baseline

Pancaking/layering
HV and LV connected customers face equivalent charges for EHV costs as EHV connected customers, and then additional charge for HV/LV costs

Extent of locational granularity for HV/LV customers

Extent of variation

Varying by secondary substation/secondary groupings

Varying by primary substation/primary groupings

DNO region charges

Basis for variation

Urban/rural or population density archetypes

Cost of existing network assets

Extent of spare capacity

Reflecting dominant flows

?

Potential Impacts of Forward-Looking Charges Changes

- **For IDNOs**
  - Will probably need to reflect arrangements in their charges to customers
- **For ICPs**
  - Probably not significantly affected
- **For Distributed Generation and Demand Customers**
  - Potentially impact existing charges with greater variability between locations and very different charging structures.
  - However suppliers unlikely to be required to pass the DUoS Charges on directly to customers

Ofgem's Access and Forward Looking Charging SCR

2nd Working Paper December 2019

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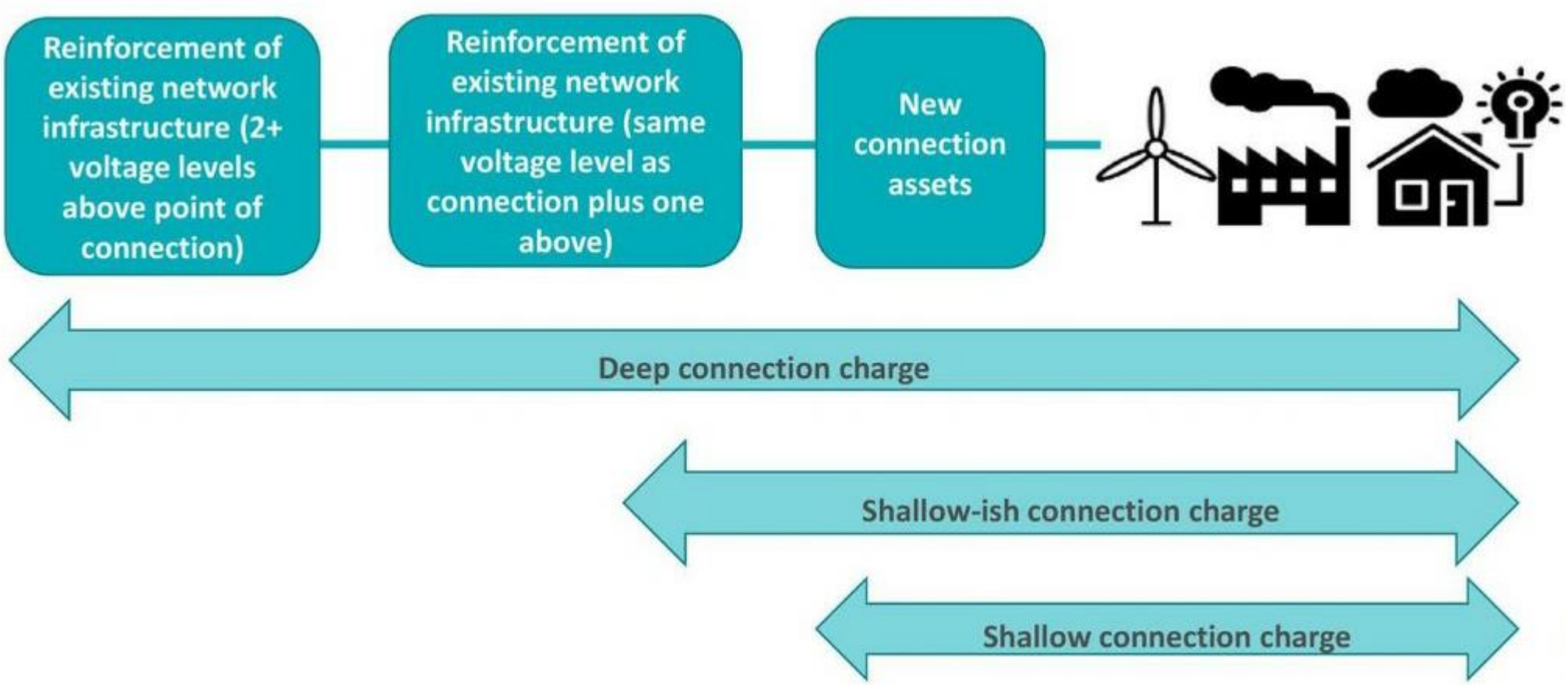
What is the ‘connections boundary’?

When connecting to the network there can be different kinds of assets required to make the connection. The ‘connections boundary’ describes the assets that the customer has to pay for.



How does it work now and what are the issues?

Transmission

- **Shallow connection boundary**
- Pay for new connecting assets up front or over time
- TOs must fund any necessary reinforcement via RIIO allowances or the ESO could actively manage the constraints through flex markets
- To protect against TOs undertaking reinforcement that is not then used, users provide securities against them cancelling their projects ('user commitment')

Distribution

- **Shallow-ish connection boundary**
- Pay upfront for new connecting assets and a share of any necessary reinforcement of the upstream network
- Can lead to high connection charges and might reduce incentives for DNOs to invest strategically, **but** provides a locational signal
- Protects wider consumers from the risk of stranded or under used infrastructure

Potential problems with these arrangements

- The difference between arrangements may be distorting investment decisions or competition between projects
- The connection arrangements could be creating barriers to entry for some users (eg upfront cost) and slow down connections of new technologies like distributed generation and EV charging infrastructure

What options are Ofgem considering?

Shallow-ish connection boundary

current arrangements

Shallower

still recovering some reinforcement costs through connection charges, but less than now

Shallow

no longer recovering any reinforcement costs through connection charges

Alternative payment arrangements

it might be possible to combine alternative payment terms such as payment over time with any of the other options

Small users options

Access SCR would consider as a priority area:

- Better defined access rights and greater choice for small users,
- Distribution use of system charging reform and reforms to the distribution connection boundary
- Potential protections to mitigate the potential adverse impacts of the reforms

Small user's workstream will consider:

- Whether **adaptations** to options may be needed to enable **domestic and microbusiness** consumers to **engage with and benefit from** new access and charging arrangements.
- This includes considering **whether any protections may be needed** for certain groups.

Overview of options

Charging options

Considering whether any limits on the level of locational or temporal granularity or degree of change in dynamic signals may be appropriate for specific types of small user demand

Access options

Considering whether any limits should apply on the choice of access option or level for specific groups of small users, for some or all demand, including a potential core access level option

Wider retail provisions

Considering the role for principles-based obligations or other retail market provisions, including possible approaches to engaging with consumers in relation to any new arrangements

Focused review of Transmission Network Charges

Focused review of transmission network charging covers:

Transmission network charging design for demand users

Transmission network charging design for Distributed Generation

The ‘reference node’

Current arrangements

	Transmission access rights	Wider locational transmission charges	Local circuit charges
Transmission-connected generation	Explicitly agreed access right	Receives credits or pays charges, based on agreed capacity	Pay charge where relevant
Distribution-connected generation >100MW	Explicitly agreed access right	Receives credits or pays charges, based on agreed capacity	Do not pay charge even where relevant
Distribution-connected generation <100MW	Generally not explicitly agreed right, unless have BEGA	Receives credits but charges capped at zero, charges as inverse demand	Do not pay charge even where relevant

Ofgem concerned that these difference could be distorting competition and leading to higher system costs for users

Potential Impacts of 2nd Working Paper Issues

- **For IDNOs**
  - Implementing different DUoS tariffs into their tariffs to suppliers
- **For ICPs**
  - Connection Charging, potentially a move to a much shallower connection boundary with more costs treated as general reinforcement, therefore lower connection costs
- **For Distributed Generation and Demand Customers**
  - Potentially impacts existing charges generally through the supplier but with lower connection costs

Significant Code Review Timetable and Summary

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Key Milestones

- The reviews are likely to result in major changes to the charging and access arrangements for customers
- Aim is to finalise the proposals mod 2021 in time for DNO RIIO-ED2 Business Plan Submissions
- Reviews are still at an early stage and impacts not yet clear
- Further updates will be provided as further information becomes available.

Questions?

Coffee Break

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Engineering Recommendation G98 & G99

Gill Williamson & Allen Rawcliffe

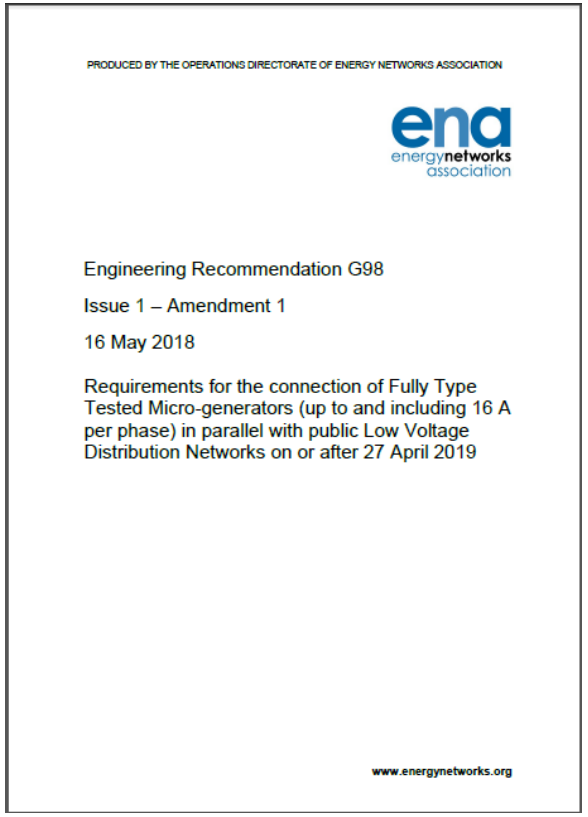
Bringing energy to your door

Stay connected...

www.enwl.co.uk

G98:

Requirements for the connection of Fully Type Tested **Micro-generators** (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks on or after 27 April 2019



PRODUCED BY THE OPERATIONS DIRECTORATE OF ENERGY NETWORKS ASSOCIATION

ena energynetworks association

Engineering Recommendation G98

Issue 1 – Amendment 1

16 May 2018

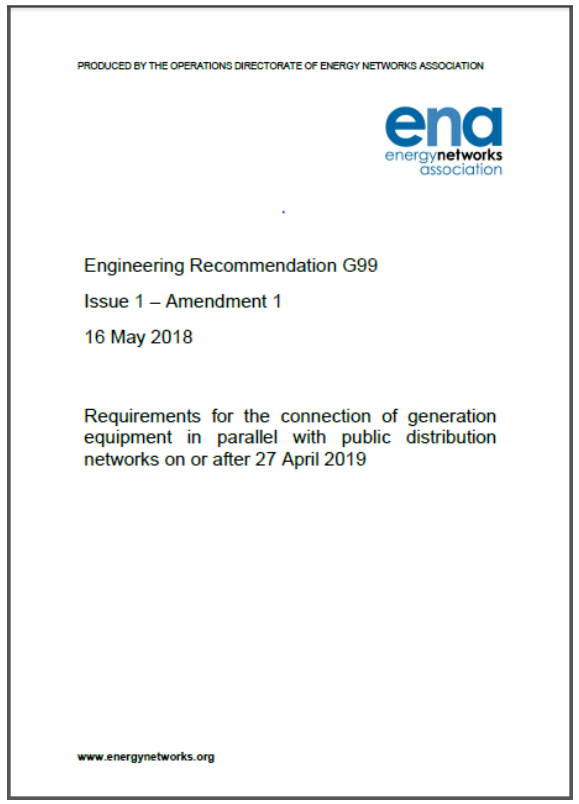
Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks on or after 27 April 2019

www.energynetworks.org

- **Low voltage**
- **Fully Type Tested**
- **16 Amps per phase**

G99:

Requirements for the connection of generation equipment in parallel with public distribution networks on or after 27 April 2019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ena energynetworks association

Engineering Recommendation G99

Issue 1 – Amendment 1

16 May 2018

Requirements for the connection of generation equipment in parallel with public distribution networks on or after 27 April 2019

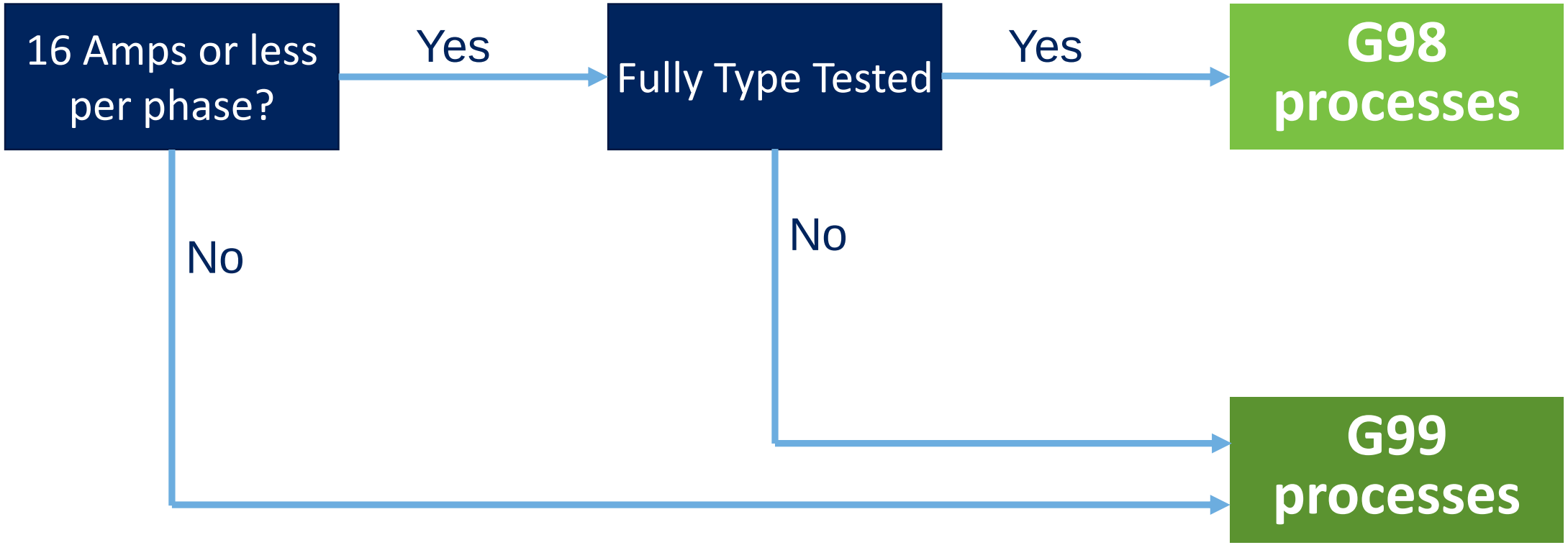
www.energynetworks.org

- **Greater than 800W**
- **Inclusive of Type Testing**

EREC G98 & EREC G99 - Agenda

Which standard?	EREC G98 Process & Forms	G99 Type A <50kW
Storage Fast Track	G99 Type A >50kW	Questions & Answers

EREC G98 & EREC G99

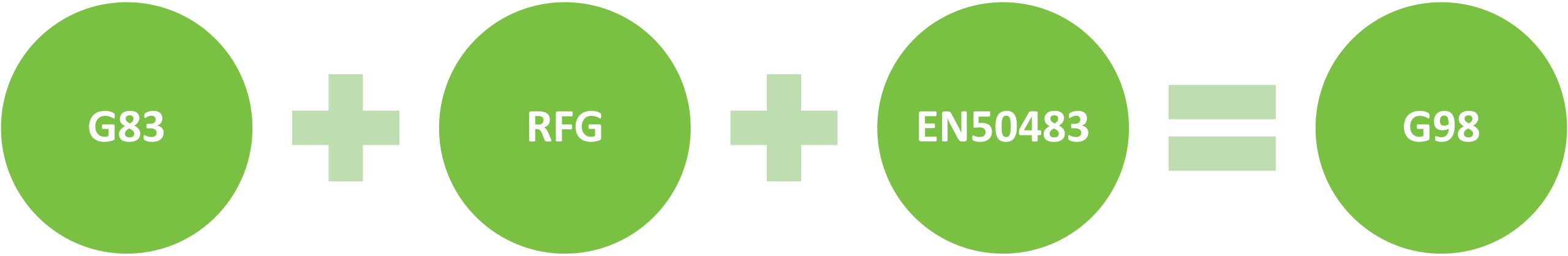


How to check whether a generator is type tested…

1) Ask the manufacturer
2) Check the ENA Type Test Register http://www.ena-eng.org/gen-ttr/
3) Ask Electricity North West

EREC G98

EREC G98 – Background and Terminology



Micro generator

A source of electrical energy and all associated interface equipment able to be connected to an electric circuit in a Low Voltage electrical installation and designed to operate in parallel with a public Low Voltage Distribution Network with nominal currents up to and including 16 A per phase.

Fully Type Tested

A Micro-generator which has been tested to ensure that the design meets the relevant technical and compliance requirements of this EREC G98, and for which the Manufacturer has declared that all similar Micro-generators supplied will be constructed to the same standards and will have the same performance.
In the case where Interface Protection functionality is included in the tested equipment, all similar products will be manufactured with the same protection settings as the tested product.

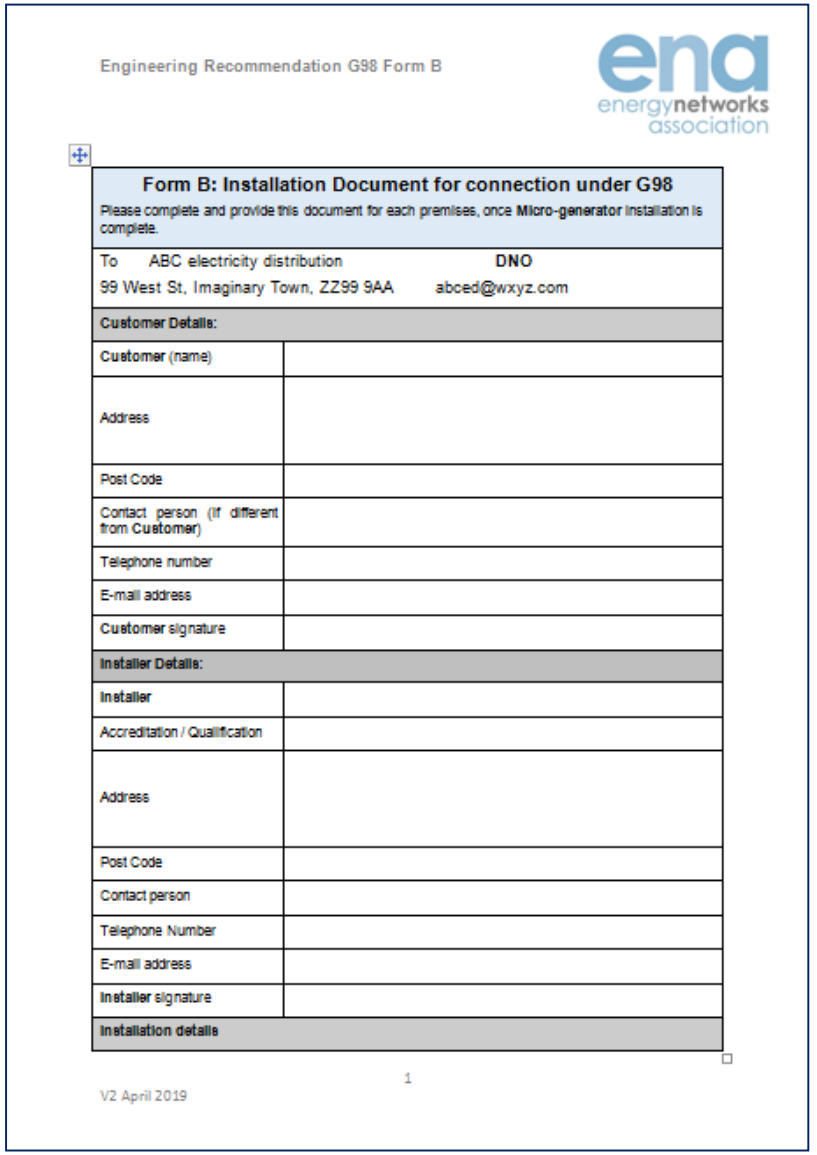
EREC G98 – Connection Process

G98 connection procedure is the same as the G83 process, **connect and notify**, except the forms have different names

	G98	
	Single premises up to and including 16 A per phase	**Multiple premises Up to and including 16 A per phase**
Application		**Form A**
Notification	**Form B**	**Form B**
Evidence	If fully type tested but not registered with the ENA- **Form C**	If fully type tested but not registered with the ENA- **Form C**

Form A - Application Form

- Submit **“Application for Connection of Multiple Micro-Generator Installations” G98 Form A**
- Submitted to connectionapplications@enwl.co.uk
- Receive and accept connection offer



Engineering Recommendation G98 Form B

ena energynetworks association

Form B: Installation Document for connection under G98

Please complete and provide this document for each premises, once **Micro-generator** installation is complete.

To ABC electricity distribution **DNO**

99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

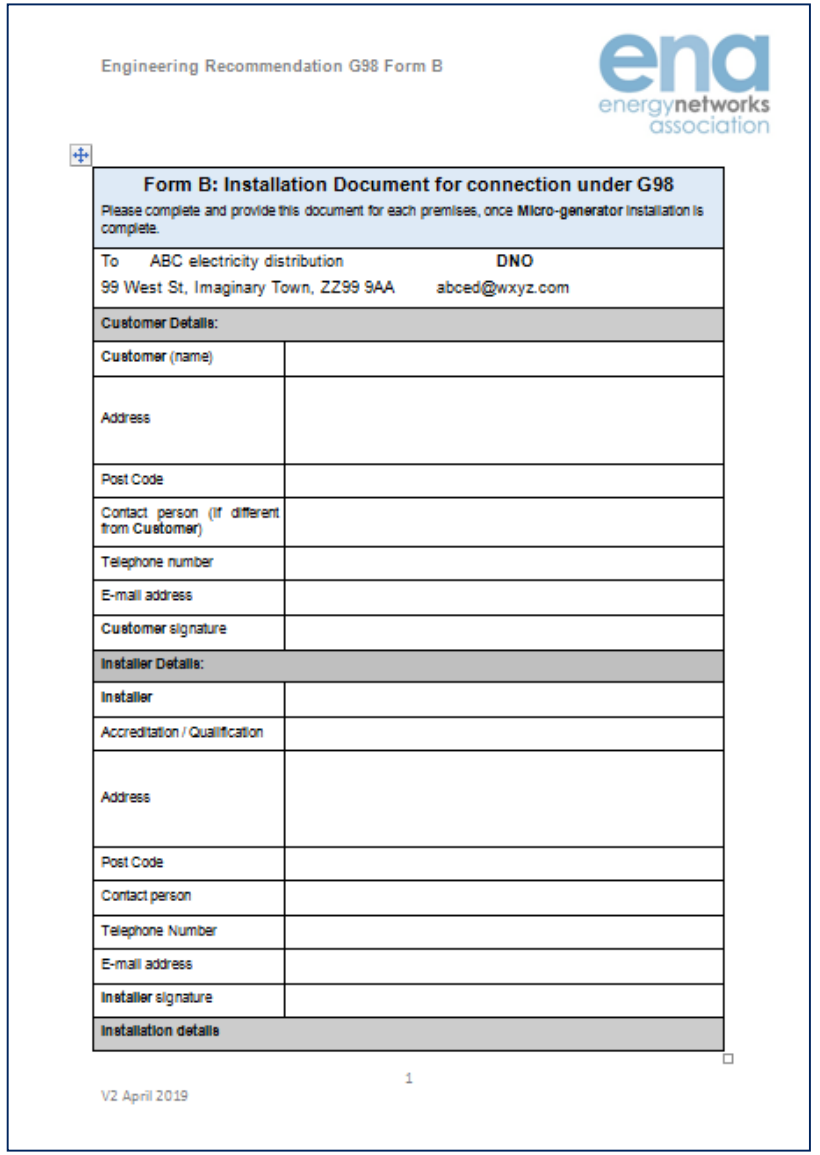
Customer Details:	
Customer (name)	
Address	
Post Code	
Contact person (if different from **Customer**)	
Telephone number	
E-mail address	
Customer signature	
Installer Details:	
Installer	
Accreditation / Qualification	
Address	
Post Code	
Contact person	
Telephone Number	
E-mail address	
Installer signature	
Installation details	

1

V2 April 2019

Form B - Notification Form

- Notify the DNO (us) within 28 days of commissioning the generating unit (*legal requirement)*
- Submitted by installer
- Latest version available on the ENA website http://www.energynetworks.org/electricity/engineering/distributed-generation/engineering-recommendation-g98.html
- Send supporting information – circuit diagram
- Submitted to G98notifications@enwl.co.uk



Engineering Recommendation G98 Form B

ena energynetworks association

Form B: Installation Document for connection under G98 Please complete and provide this document for each premises, once Micro-generator installation is complete.	
To ABC electricity distribution 99 West St, Imaginary Town, ZZ99 9AA	DNO abced@wxyz.com
Customer Details:	
Customer (name)	
Address	
Post Code	
Contact person (if different from Customer)	
Telephone number	
E-mail address	
Customer signature	
Installer Details:	
Installer	
Accreditation / Qualification	
Address	
Post Code	
Contact person	
Telephone Number	
E-mail address	
Installer signature	
Installation details	

1

V2 April 2019

EREC G98 – Notifications

Page 1

Form B: Installation Document for connection under G98

Please complete and provide this document for each premises, once **Micro-generator** installation is complete.

To ABC electricity distribution **DNO**

99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

Customer Details:	
Customer (name)	
Address	
Post Code	
Contact person (if different from **Customer**)	
Telephone number	
E-mail address	
Customer signature	
Installer Details:	
Installer	
Accreditation / Qualification	
Address	
Post Code	
Contact person	
Telephone Number	
E-mail address	
Installer signature	
Installation details	
Address	
Post Code	
MPAN(s)	
Location within **Customer's Installation**	

Generator owner's contact details

Installers details including accreditation

Details about the site where the generator has been connected

Page 2

Location of Lockable Isolation Switch	

Details of Micro-generators. Use a separate line for new and existing installations and for different technology type. Use PH 1 column for single phase supply.

Manufacturer	Date of Installation	Technology Type / Primary Energy Source please enter code from table below	Manufacturer's Ref No (this number should be registered on the ENA **Type Test Verification Report** Register as Product ID)	**Micro-generator Registered Capacity** in kW				
				3-Phase Units	Single Phase Units			Power Factor
					PH1	PH2	PH3	

Declaration – to be completed by Installer for Micro-generators Tested to EREC G98

I declare that the relevant **Micro-generators** and the installation which together form a **Micro-generating Plant** within the scope of EREC G98 at the above address, conform to the requirements of EREC G98. This declaration of compliance is confined to **Micro-generating Plant** tested to EREC G98 or EREC G83 as applicable at the time of commissioning.

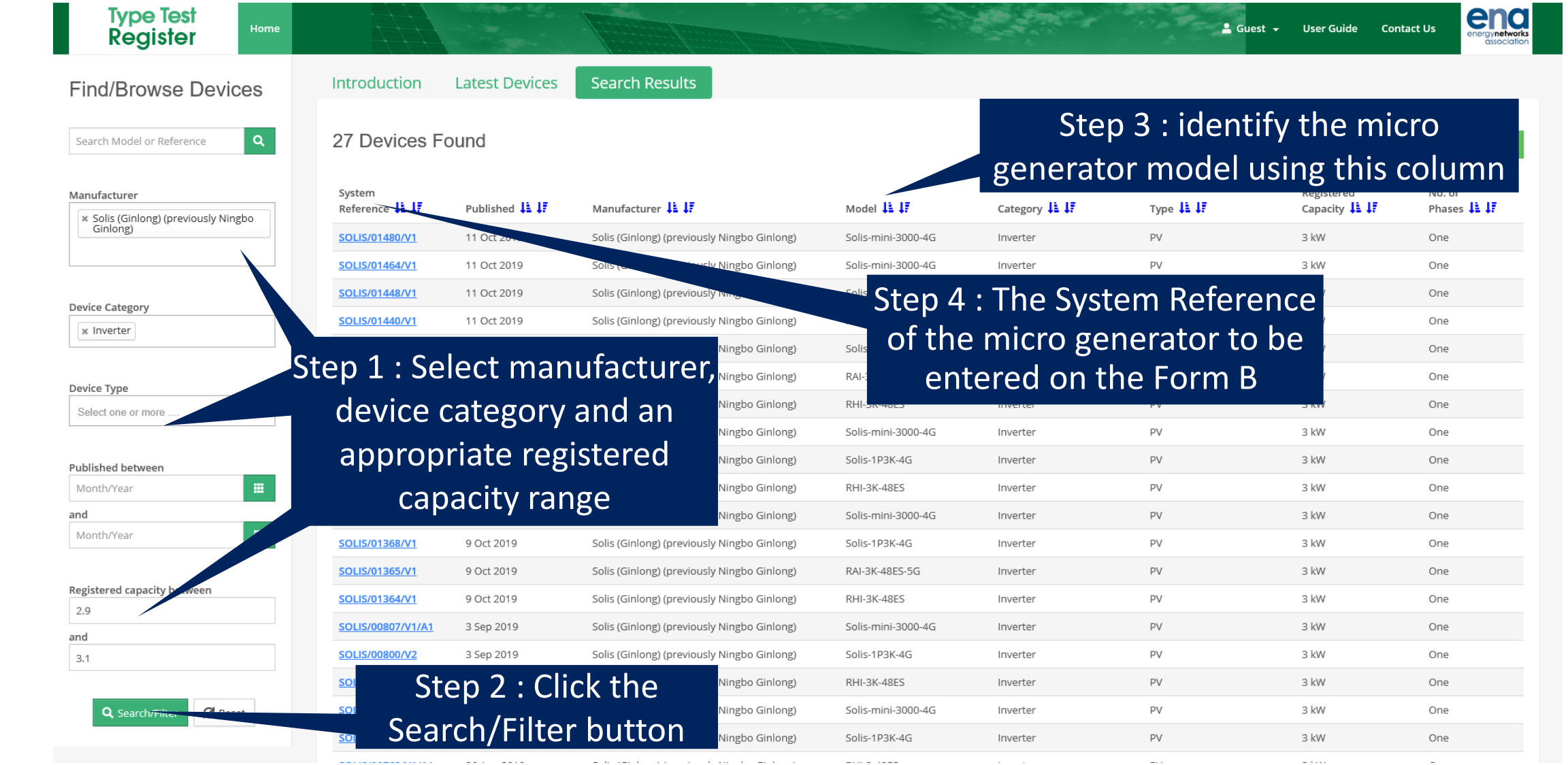
Signature:	Date:

Primary Energy Source	Code	Primary Energy Source	Code
Solar PV	1	Wind	2
Hydro (run of river)	3	Hydro (reservoir)	4
Biomass	5	Other Renewable	6
Fossil gas	7	Waste	8
Fossil coal gas	9	Fossil oil	10
Fossil oil shale	11	Fossil peat	12
Geothermal	13	Fossil brown coal/lignite	14
Fossil hard coal	15	Hydro pumped storage	16

Technical details of the generator (see next slide for guidance on the Manufacture's Reference No.)

Signed declaration of compliance with EREC G98

EREC G98 – Notifications



Step 3 : identify the micro generator model using this column

Step 4 : The System Reference of the micro generator to be entered on the Form B

Step 1 : Select manufacturer, device category and an appropriate registered capacity range

Step 2 : Click the Search/Filter button

http://www.ena-eng.org/gen-ttr/

Type Test Register Manufacturer's Reference No. Demo

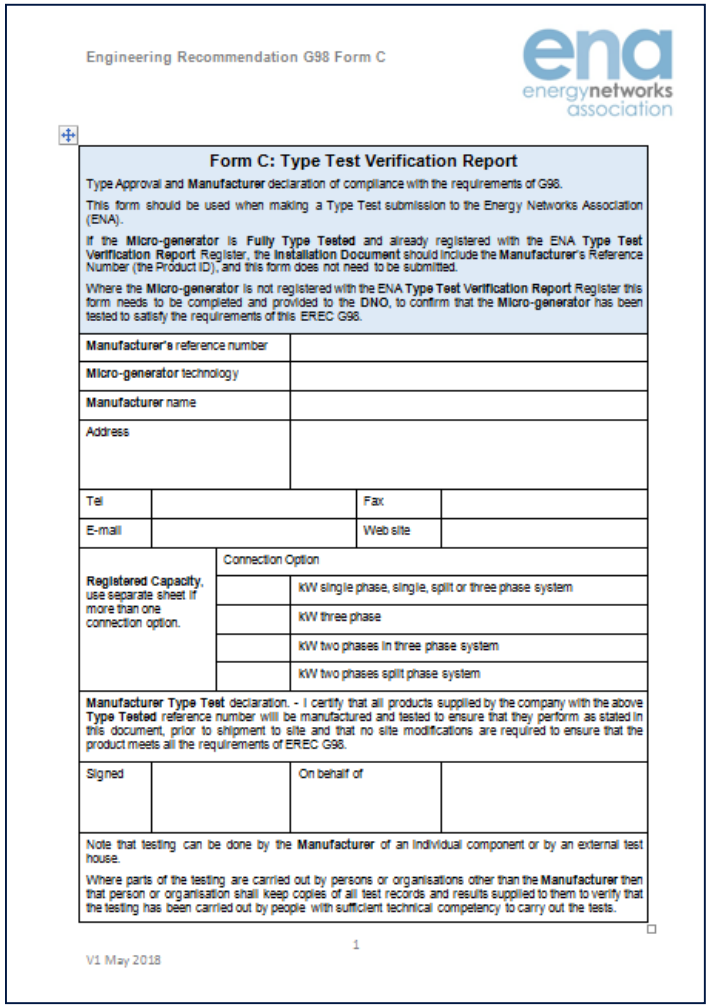
EREC G98 – Notifications

➢ No Manufacturer's Reference Number

NOT on ENA Type Test Register

Submit

Form C – Type Test Verification Report



Engineering Recommendation G98 Form C

ena energynetworks association

Form C: Type Test Verification Report

Type Approval and **Manufacturer** declaration of compliance with the requirements of G98.

This form should be used when making a Type Test submission to the Energy Networks Association (ENA).

If the **Micro-generator** is **Fully Type Tested** and already registered with the ENA **Type Test Verification Report** Register, the **Installation Document** should include the **Manufacturer's** Reference Number (the Product ID), and this form does not need to be submitted.

Where the **Micro-generator** is not registered with the ENA **Type Test Verification Report** Register this form needs to be completed and provided to the **DNO**, to confirm that the **Micro-generator** has been tested to satisfy the requirements of this EREC G98.

Manufacturer's reference number	
Micro-generator technology	
Manufacturer name	
Address	

Tel		Fax	
E-mail		Web site	

Registered Capacity, use separate sheet if more than one connection option.	Connection Option	
		kW single phase, single, split or three phase system
		kW three phase
		kW two phases in three phase system
		kW two phases split phase system

Manufacturer Type Test declaration. - I certify that all products supplied by the company with the above **Type Tested** reference number will be manufactured and tested to ensure that they perform as stated in this document, prior to shipment to site and that no site modifications are required to ensure that the product meets all the requirements of EREC G98.

Signed		On behalf of	

Note that testing can be done by the **Manufacturer** of an individual component or by an external test house.

Where parts of the testing are carried out by persons or organisations other than the **Manufacturer** then that person or organisation shall keep copies of all test records and results supplied to them to verify that the testing has been carried out by people with sufficient technical competency to carry out the tests.

1

V1 May 2018

Generators will be requested to disconnect if the generator is found to be non-compliant

EREC G98 – Compliance check

- Electricity North West check that all installed generators are compliant with G98 requirements based on submitted Form B
- We have legal responsibility to ensure all connected generators are compliant
- We may need to come back for further information if the form is not complete
- *An entry on the ENA Type Test Register is not confirm compliance*

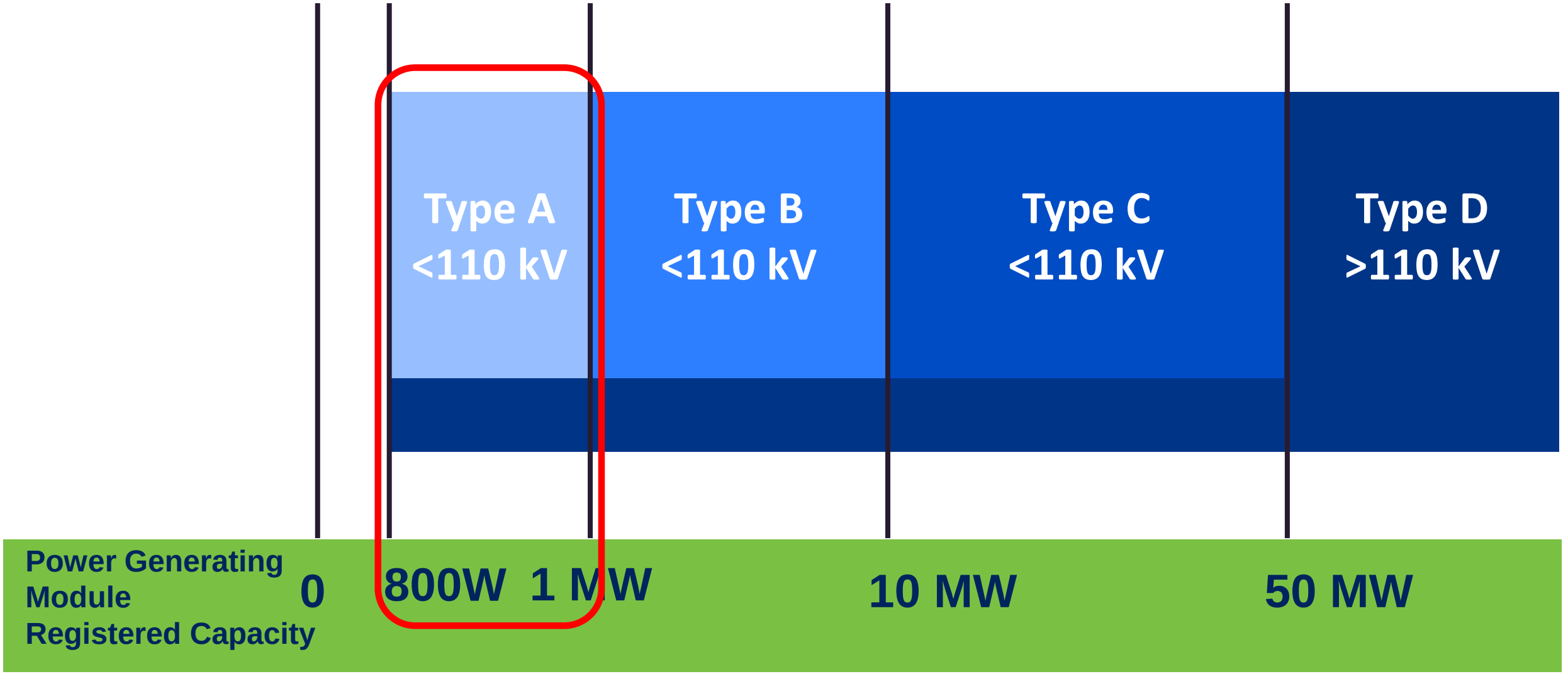
ENA Type Test Register

The responsibility for the accuracy and validity of the product information held in the register is on the respective manufacturers who submit their compliance declarations to this register. ENA does not act as an equipment certification body and the presence of a manufacturer's device on ENA's Type Test Register does not indicate whether the device is compliant with the required specification or not. Generation connection customers are responsible for procuring and installing compliant equipment and are expected to undertake their own checks of the compliance of the generation equipment held on the register.

EREC G99

EREC G99 - Types (GB)

- Types affect technical requirements and which forms you use

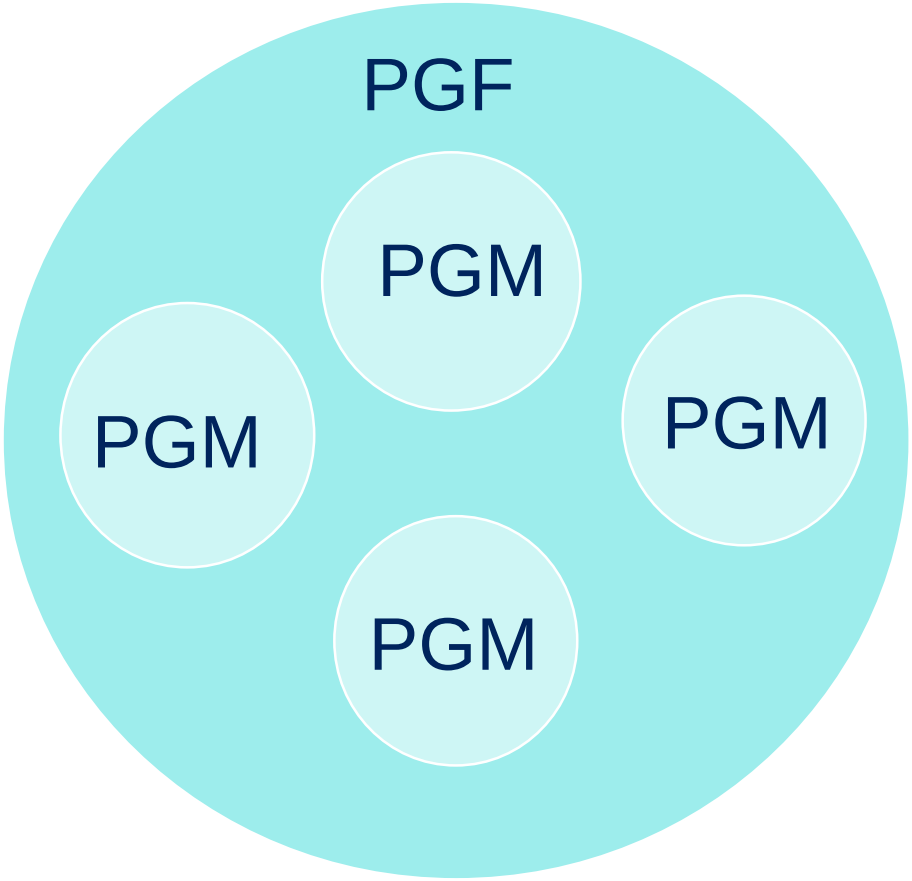


EREC G99 - Power Generating Units & Power Generating Modules

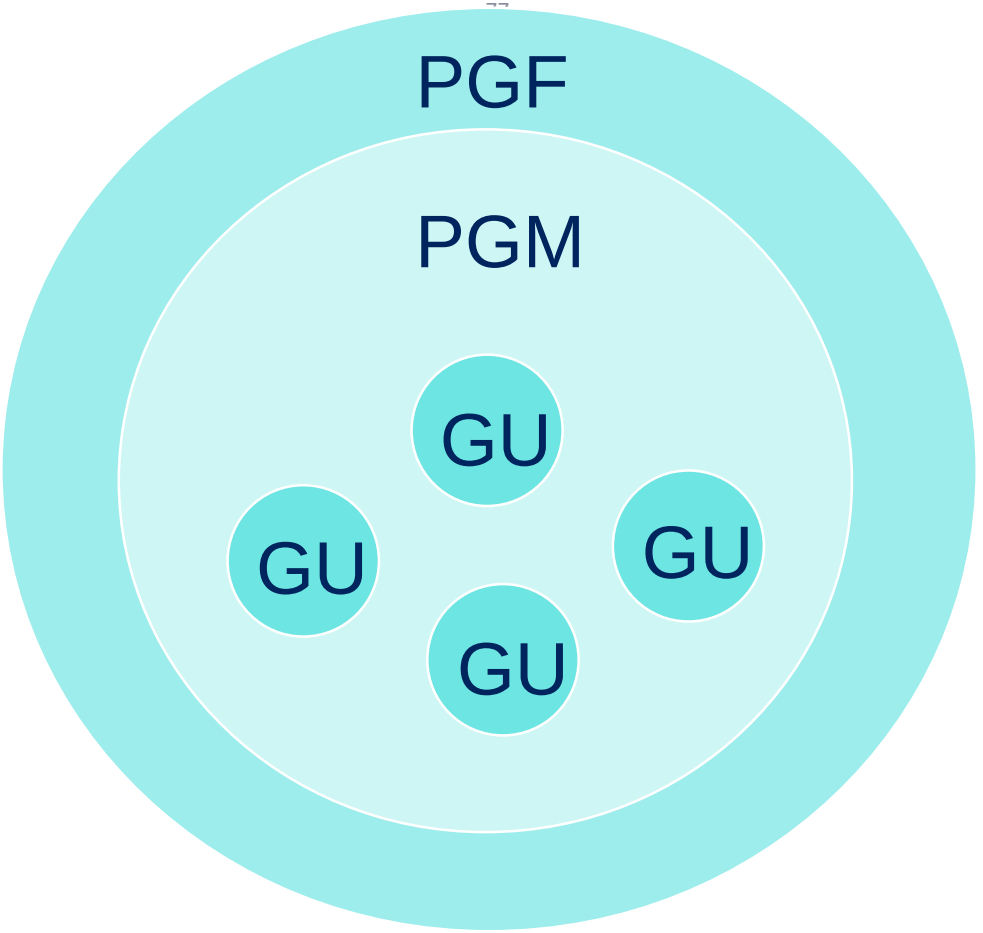
Types depend on PGM capacity

PGM definition depends on whether the technology is synchronous / asynchronous

SYNCHRONOUS SCHEME



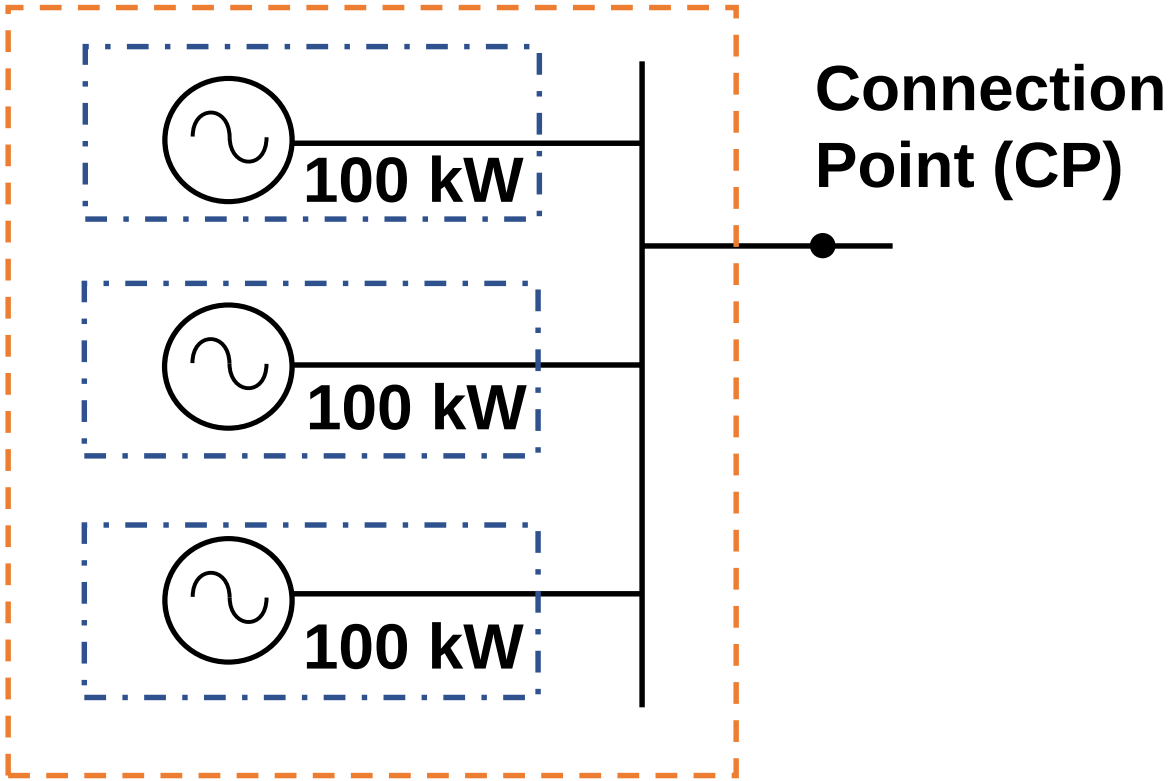
ASYNCHRONOUS SCHEME



Generating Unit, GU
Power Generating Module, PGM
Power Generating Facility, PGF

EREC G99 – Type A synchronous machine example

3 x **100 kW Type A Synchronous PGMs** = 0.3 MW PGF

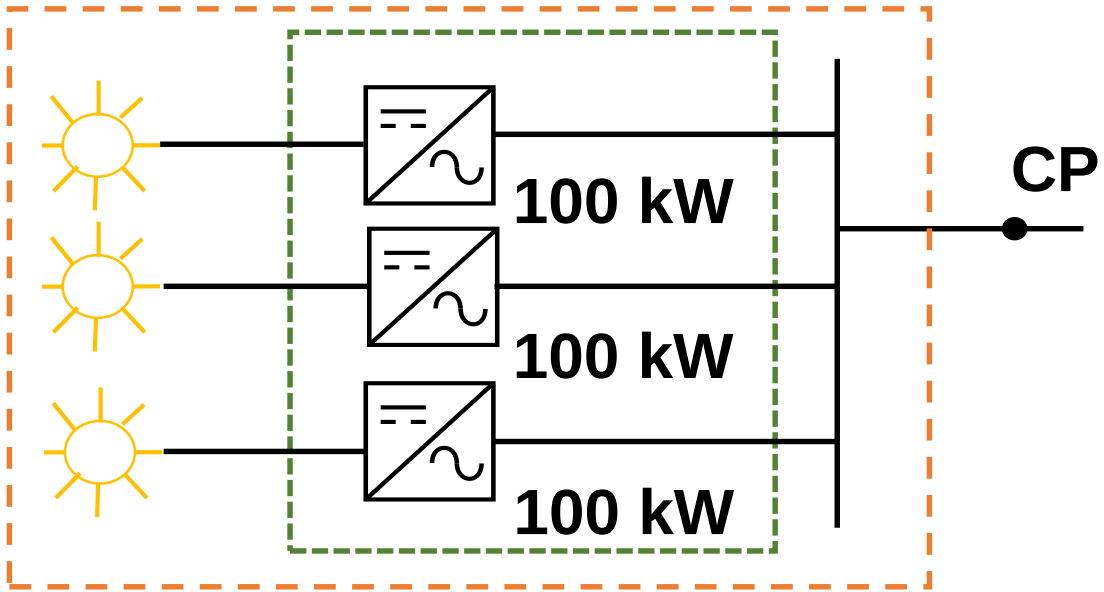


Power Generating Module (PGM) / Synchronous Power Generating Module

Power Generating Facility (PGF)

EREC G99 – Type A asynchronous example

3 x 100 kW Inverter connected GUs = **0.3 MW Type A PPM** = 0.3 MW PGF



Power Generating Module (PGM) / Power Park Module (PPM)

Power Generating Facility (PGF)

EREC G99 – Type A connection processes

Simpler connection processes available for smaller PGMs:-

PGM less than 50kW 3-phase, 17kW single phase

Integrated micro generation and storage installations

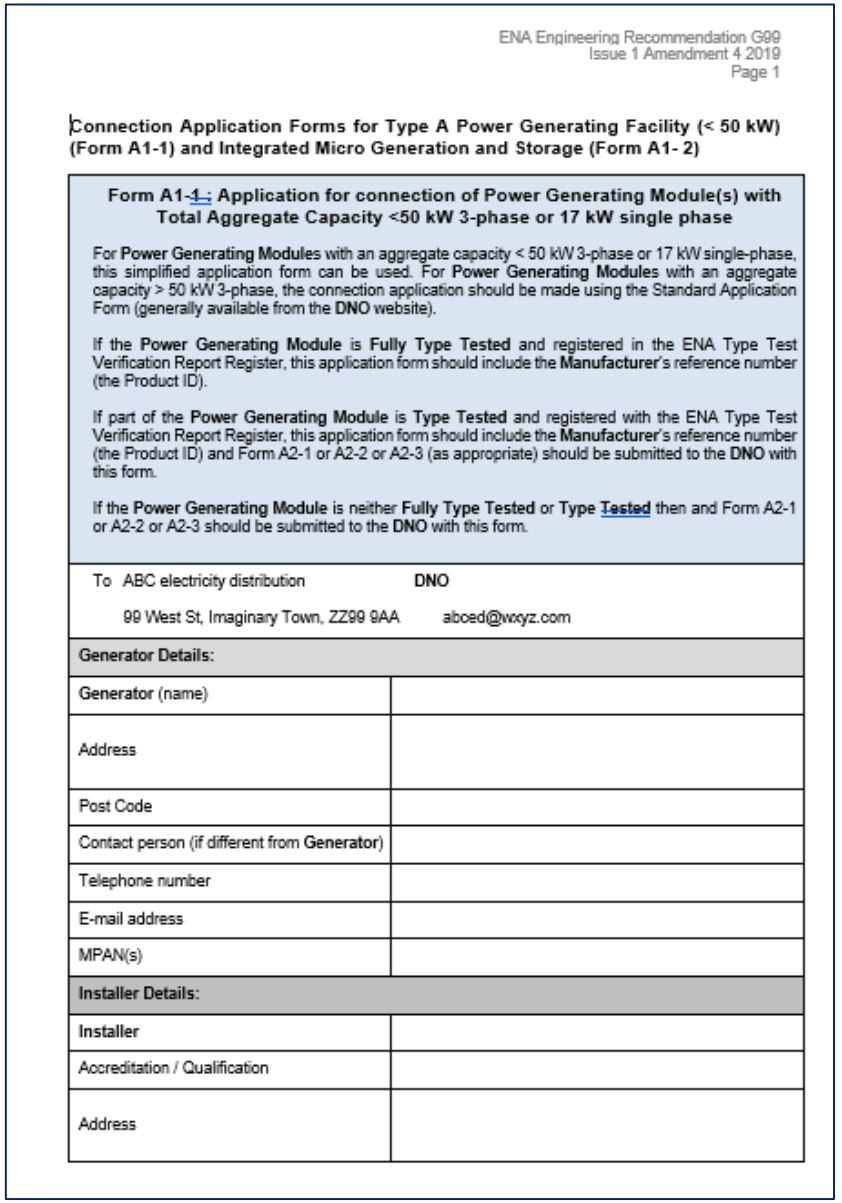
Type A greater than 50kW

EREC G99 – Connection Process

	G99		
	Less than 50kW	**Integrated Micro-generation & storage** (each up to & including 16 A per phase)	**Greater than 50kW & less than 1MW Type A**
Application	**Form A1-1**	**Form A1-2**	**Standard Application form (SAF)**
Notification	**Form A3-1**	**Form A3-2**	**Form A3-1**
Evidence	If not type tested – **Form A2-1** synchronous <50kW, **Form A2-2** synchronous >50kW or **Form A2-3** inverter connected gen	If not type tested – **Form A2-1** synchronous <50kW, **Form A2-2** synchronous >50kW or **Form A2-3** inverter connected gen	If not type tested- **Form A2-2** synchronous **Form A2-3** inverter connected gen

Form A1-1 Application Form

- Submit **"Application for Connection of Power Generator Modules with total aggregate capacity <50kW 3-phase and 17kW single phase" G99 Form A1-1**
- *Include Manufacturer's Reference No. from ENA Type Test register*
- *Submit Form A2-1, A2-2 or A2-3 with application if not on ENA Type Test Register*
- Submitted to connectionapplications@enwl.co.uk
- Receive and accept connection offer



ENA Engineering Recommendation G99
Issue 1 Amendment 4 2019
Page 1

Connection Application Forms for Type A Power Generating Facility (< 50 kW) (Form A1-1) and Integrated Micro Generation and Storage (Form A1- 2)

Form A1-1: Application for connection of Power Generating Module(s) with Total Aggregate Capacity <50 kW 3-phase or 17 kW single phase

For **Power Generating Modules** with an aggregate capacity < 50 kW 3-phase or 17 kW single-phase, this simplified application form can be used. For **Power Generating Modules** with an aggregate capacity > 50 kW 3-phase, the connection application should be made using the Standard Application Form (generally available from the **DNO** website).

If the **Power Generating Module** is **Fully Type Tested** and registered in the ENA Type Test Verification Report Register, this application form should include the **Manufacturer**'s reference number (the Product ID).

If part of the **Power Generating Module** is **Type Tested** and registered with the ENA Type Test Verification Report Register, this application form should include the **Manufacturer**'s reference number (the Product ID) and Form A2-1 or A2-2 or A2-3 (as appropriate) should be submitted to the **DNO** with this form.

If the **Power Generating Module** is neither **Fully Type Tested** or **Type Tested** then and Form A2-1 or A2-2 or A2-3 should be submitted to the **DNO** with this form.

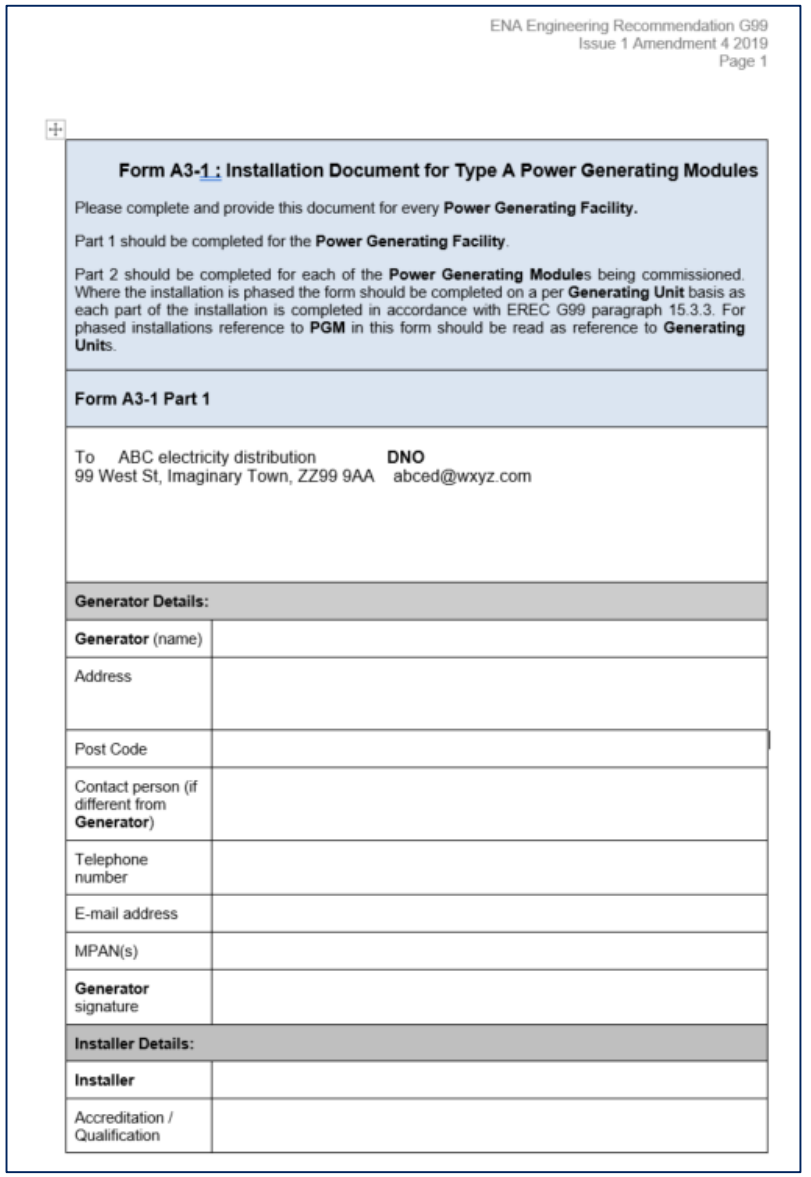
To ABC electricity distribution **DNO**

99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	
MPAN(s)	
Installer Details:	
Installer	
Accreditation / Qualification	
Address	

Form A3-1 - Notification Form

- Notify the DNO (us) within 28 days of commissioning the generating unit (*legal requirement)*
- Submit the **“Installation Document for Type A Power Generating Modules” G99 Form A3-1**
- Send supporting information – circuit diagram
- Submitted to G98notifications@enwl.co.uk



ENA Engineering Recommendation G99
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Page 1

Form A3-1 : Installation Document for Type A Power Generating Modules

Please complete and provide this document for every **Power Generating Facility.**

Part 1 should be completed for the **Power Generating Facility**.

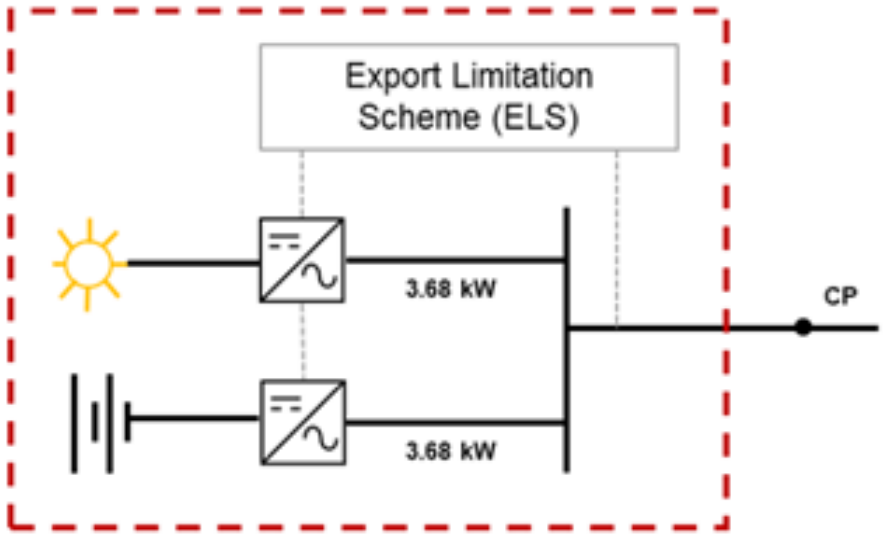
Part 2 should be completed for each of the **Power Generating Module**s being commissioned. Where the installation is phased the form should be completed on a per **Generating Unit** basis as each part of the installation is completed in accordance with EREC G99 paragraph 15.3.3. For phased installations reference to **PGM** in this form should be read as reference to **Generating Unit**s.

Form A3-1 Part 1

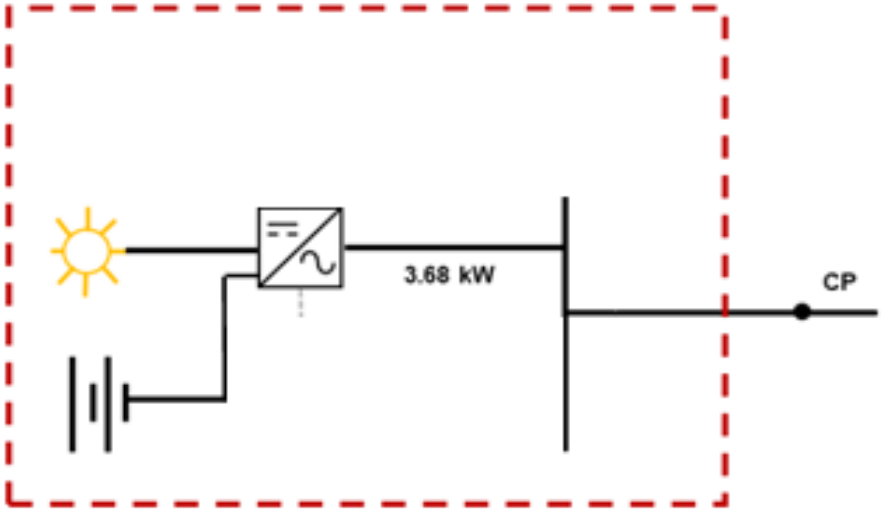
To ABC electricity distribution **DNO**
99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	
MPAN(s)	
Generator signature	
Installer Details:	
Installer	
Accreditation / Qualification	

EREC G99 – Fast track connection process for integrated micro generation and storage



Integrated Micro Generation and Storage



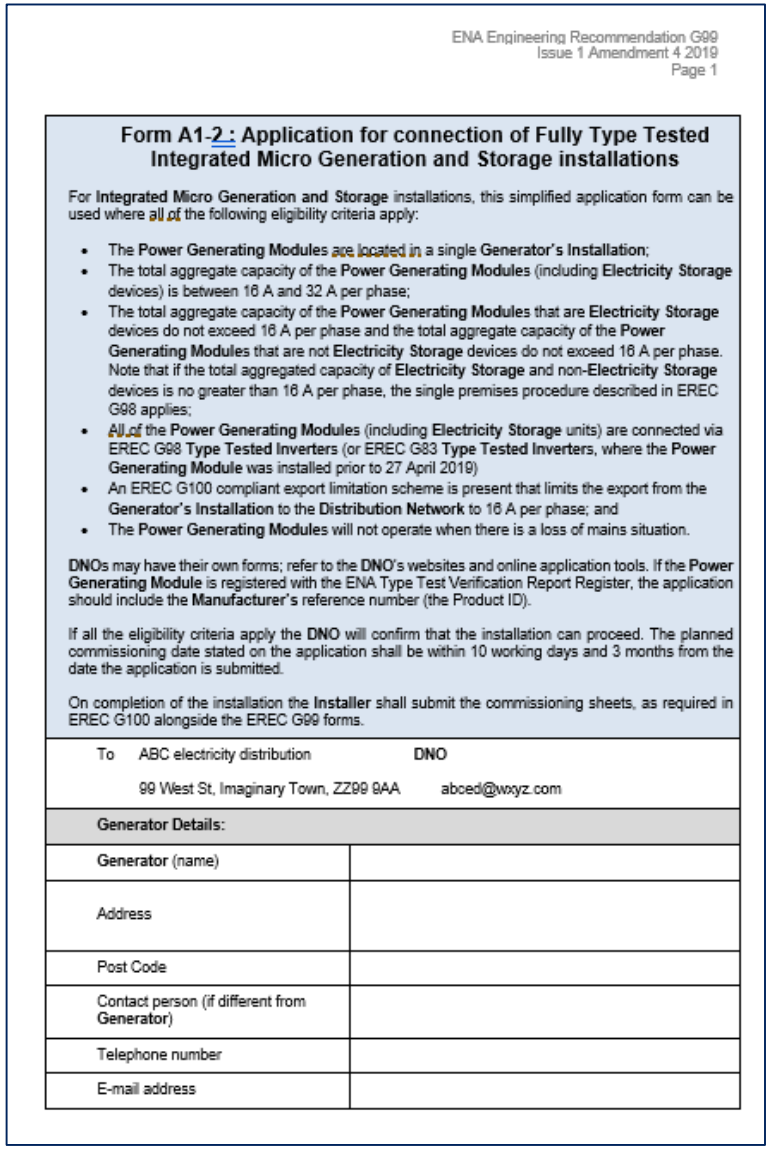
Not Micro Generation and Storage
G98 is applicable as this is a 3.68kW PGM

Fast track process is available for integrated micro generation and storage on the same site, if;

- Type tested
- *16 Amps > Aggregate Capacity < 32 Amps per phase*
- *Individual Capacity < 16 Amps*
- *G100 16 Amp export limit*

Form A1-2 Application Form

- Submit **"Application for Connection of Power Generator Modules with total aggregate capacity <50kW 3-phase and 17kW single phase" G99 Form A1-1**
- Submitted to connectionapplications@enwl.co.uk
- ENWL check that Integrated Micro Generation and Storage installation requirements are satisfied
- ENWL aim to respond in 10 working days
- Receive and accept connection offer



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Form A1-2 : Application for connection of Fully Type Tested Integrated Micro Generation and Storage installations

For **Integrated Micro Generation and Storage** installations, this simplified application form can be used where all of the following eligibility criteria apply:

- The **Power Generating Modules** are located in a single **Generator's Installation**;
- The total aggregate capacity of the **Power Generating Modules** (including **Electricity Storage** devices) is between 16 A and 32 A per phase;
- The total aggregate capacity of the **Power Generating Modules** that are **Electricity Storage** devices do not exceed 16 A per phase and the total aggregate capacity of the **Power Generating Modules** that are not **Electricity Storage** devices do not exceed 16 A per phase. Note that if the total aggregated capacity of **Electricity Storage** and non-**Electricity Storage** devices is no greater than 16 A per phase, the single premises procedure described in EREC G98 applies;
- All of the **Power Generating Modules** (including **Electricity Storage** units) are connected via EREC G98 **Type Tested Inverters** (or EREC G83 **Type Tested Inverters**, where the **Power Generating Module** was installed prior to 27 April 2019)
- An EREC G100 compliant export limitation scheme is present that limits the export from the **Generator's Installation** to the **Distribution Network** to 16 A per phase; and
- The **Power Generating Modules** will not operate when there is a loss of mains situation.

DNOs may have their own forms; refer to the **DNO**'s websites and online application tools. If the **Power Generating Module** is registered with the ENA Type Test Verification Report Register, the application should include the **Manufacturer's** reference number (the Product ID).

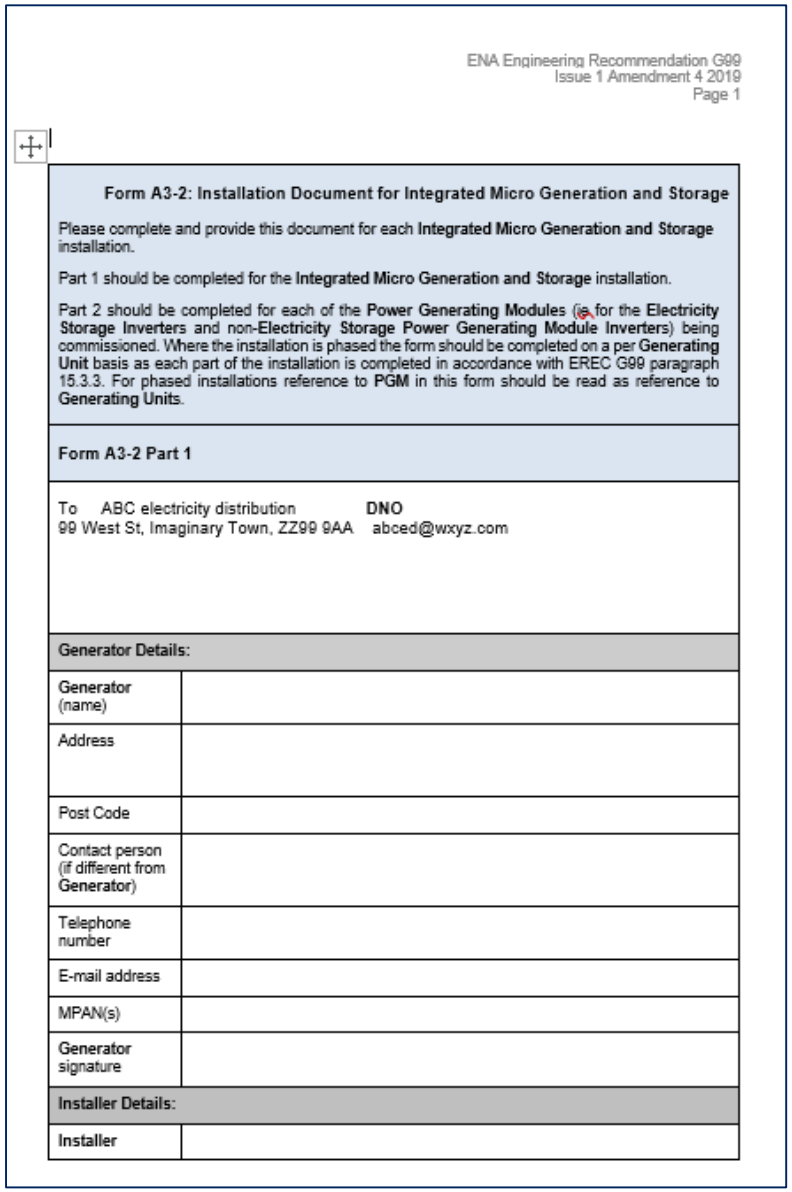
If all the eligibility criteria apply the **DNO** will confirm that the installation can proceed. The planned commissioning date stated on the application shall be within 10 working days and 3 months from the date the application is submitted.

On completion of the installation the **Installer** shall submit the commissioning sheets, as required in EREC G100 alongside the EREC G99 forms.

To ABC electricity distribution **DNO**	
99 West St, Imaginary Town, ZZ99 9AA abcd@wxyz.com	
Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	

Form A3-2 - Notification Form

- Commissioning date shall be within 10 working days and 3 months from the date that the application
- Notify the DNO (us) within 28 days of commissioning the generating unit (*legal requirement)*
- Submit the **"Installation Document for Integrated Micro Generation and Storage" G99 Form A3-2**
- Send supporting information – circuit diagram
- Submitted to G98notifications@enwl.co.uk



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Form A3-2: Installation Document for Integrated Micro Generation and Storage

Please complete and provide this document for each **Integrated Micro Generation and Storage** installation.

Part 1 should be completed for the **Integrated Micro Generation and Storage** installation.

Part 2 should be completed for each of the **Power Generating Modules** (e.g. for the **Electricity Storage Inverters** and non-**Electricity Storage Power Generating Module Inverters**) being commissioned. Where the installation is phased the form should be completed on a per **Generating Unit** basis as each part of the installation is completed in accordance with EREC G99 paragraph 15.3.3. For phased installations reference to **PGM** in this form should be read as reference to **Generating Units**.

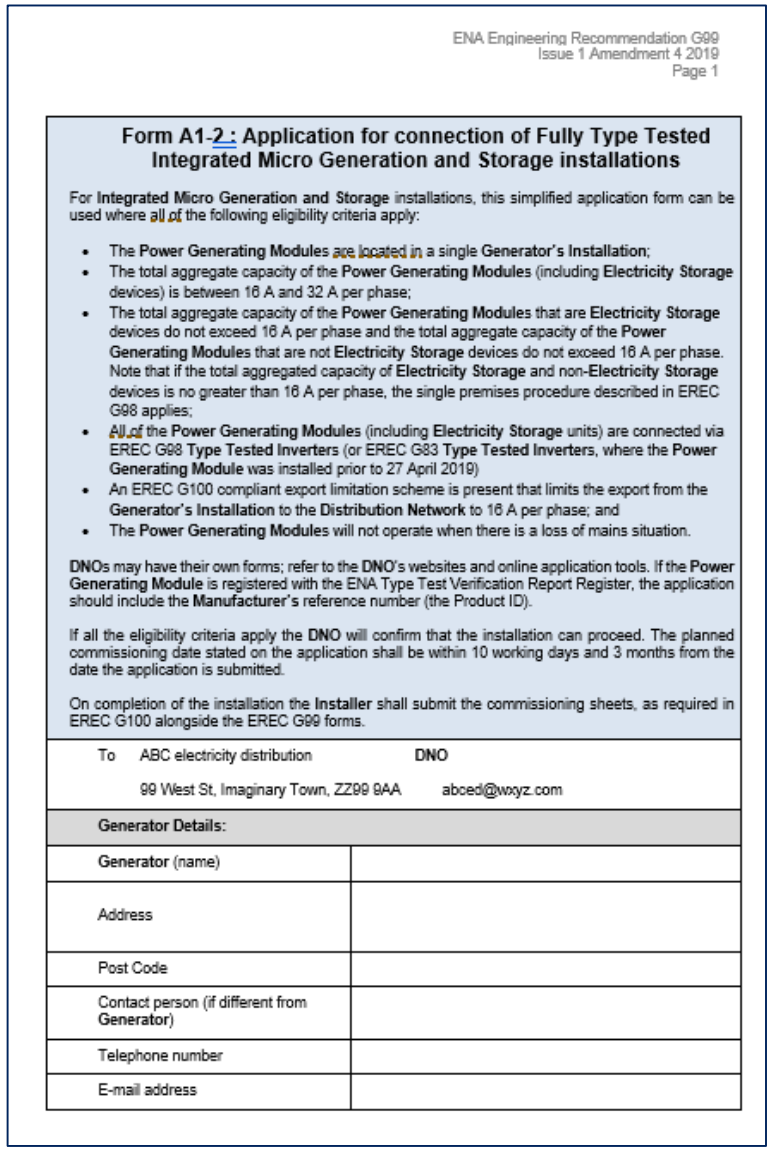
Form A3-2 Part 1

To ABC electricity distribution **DNO**
99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	
MPAN(s)	
Generator signature	
Installer Details:	
Installer	

Standard Application Form SAF

- Submit **Standard Application Form** (ENA or ENW website)
- Submitted to connectionapplications@enwl.co.uk
- ENWL will provide a quotation for LV generator connections within 45 working days
- Receive and accept connection offer



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Form A1-2 : Application for connection of Fully Type Tested Integrated Micro Generation and Storage installations

For **Integrated Micro Generation and Storage** installations, this simplified application form can be used where all of the following eligibility criteria apply:

- The **Power Generating Modules** are located in a single **Generator's Installation**;
- The total aggregate capacity of the **Power Generating Modules** (including **Electricity Storage** devices) is between 16 A and 32 A per phase;
- The total aggregate capacity of the **Power Generating Modules** that are **Electricity Storage** devices do not exceed 16 A per phase and the total aggregate capacity of the **Power Generating Modules** that are not **Electricity Storage** devices do not exceed 16 A per phase. Note that if the total aggregated capacity of **Electricity Storage** and non-**Electricity Storage** devices is no greater than 16 A per phase, the single premises procedure described in EREC G98 applies;
- All of the **Power Generating Modules** (including **Electricity Storage** units) are connected via EREC G98 **Type Tested Inverters** (or EREC G83 **Type Tested Inverters**, where the **Power Generating Module** was installed prior to 27 April 2019)
- An EREC G100 compliant export limitation scheme is present that limits the export from the **Generator's Installation** to the **Distribution Network** to 16 A per phase; and
- The **Power Generating Modules** will not operate when there is a loss of mains situation.

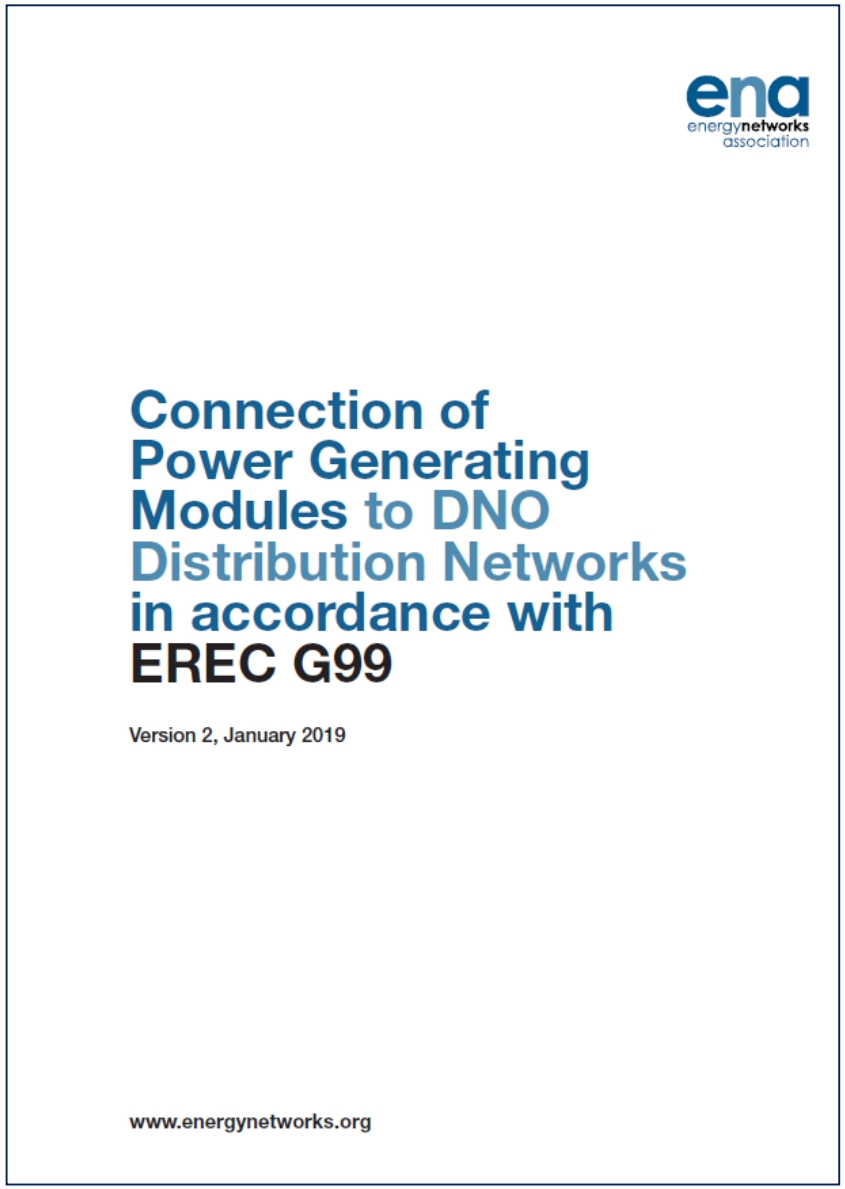
DNOs may have their own forms; refer to the **DNO**'s websites and online application tools. If the **Power Generating Module** is registered with the ENA Type Test Verification Report Register, the application should include the **Manufacturer's** reference number (the Product ID).

If all the eligibility criteria apply the **DNO** will confirm that the installation can proceed. The planned commissioning date stated on the application shall be within 10 working days and 3 months from the date the application is submitted.

On completion of the installation the **Installer** shall submit the commissioning sheets, as required in EREC G100 alongside the EREC G99 forms.

To ABC electricity distribution **DNO** 99 West St, Imaginary Town, ZZ99 9AA abcd@wxyz.com	
Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	

EREC G99 – Standard Application Form, SAF



Changes include:-

- Alignment of terminology with G99 (PGM, GU etc)
- Inclusion of storage data
- New technical data

Can be accessed from our website: *https://www.enwl.co.uk/get-connected/new-connection/generation-connection/over-200kw/*

EREC G99 – Standard Application Form, SAF

- ***SAF >50kW 3-phase***
  - *Different parts submitted at different times*
  - *Different parts for different technologies*

Part 1 Contact details, location and operational information
Part 1a Supplementary contact details
Part 2 Power Generating Facility general data
Part 3 Power Generating Module model data

Initial Submission

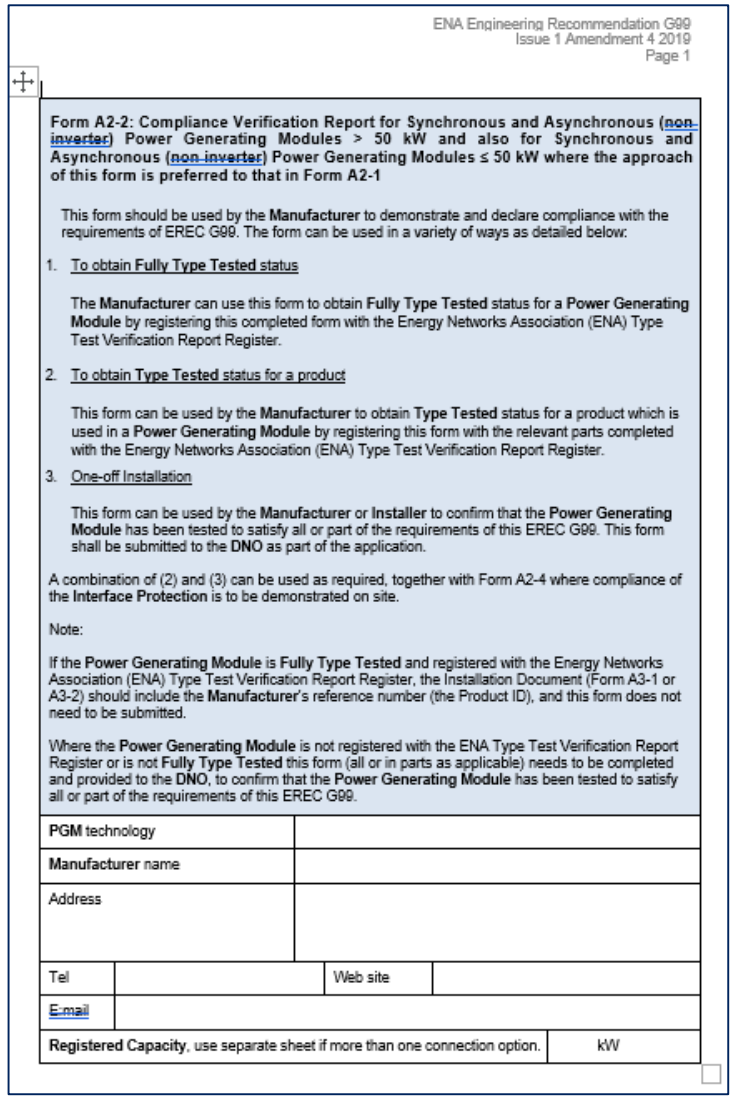
Part 4a Synchronous Power Generating Modules
Part 4b Power Park Module model data: Fixed speed induction Generating Units
Part 4c Power Park Module model data: Doubly fed induction Generating Units
Part 4d Power Park Module model data: Series inverter connected Generating Units
Part 4e Power Park Module model data: Electricity Storage plant
Part 4f Transformer information
Part 5 Additional data which may be required by the DNO

Prior to Synchronising

Additional forms are required when the generator is not type tested

- *Submit evidence of compliance with application*
  - **"Compliance Verification Report for Synchronous Power Generating Modules > 50 kW" Form A2-2**
  - **"Compliance Verification Report for Inverter Connected Power Generating Modules" Form A2-3**

- Submit **"Site Compliance and Commissioning test requirements for Type A Power Generating Modules" Form A2-4** if the Interface Protection is not Type Tested or for other site compliance tests are required



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Form A2-2: Compliance Verification Report for Synchronous and Asynchronous (non-inverter) Power Generating Modules > 50 kW and also for Synchronous and Asynchronous (non-inverter) Power Generating Modules ≤ 50 kW where the approach of this form is preferred to that in Form A2-1

This form should be used by the **Manufacturer** to demonstrate and declare compliance with the requirements of EREC G99. The form can be used in a variety of ways as detailed below:

1. To obtain **Fully Type Tested** status

   The **Manufacturer** can use this form to obtain **Fully Type Tested** status for a **Power Generating Module** by registering this completed form with the Energy Networks Association (ENA) Type Test Verification Report Register.

2. To obtain **Type Tested** status for a product

   This form can be used by the **Manufacturer** to obtain **Type Tested** status for a product which is used in a **Power Generating Module** by registering this form with the relevant parts completed with the Energy Networks Association (ENA) Type Test Verification Report Register.

3. One-off Installation

   This form can be used by the **Manufacturer** or **Installer** to confirm that the **Power Generating Module** has been tested to satisfy all or part of the requirements of this EREC G99. This form shall be submitted to the **DNO** as part of the application.

A combination of (2) and (3) can be used as required, together with Form A2-4 where compliance of the **Interface Protection** is to be demonstrated on site.

Note:

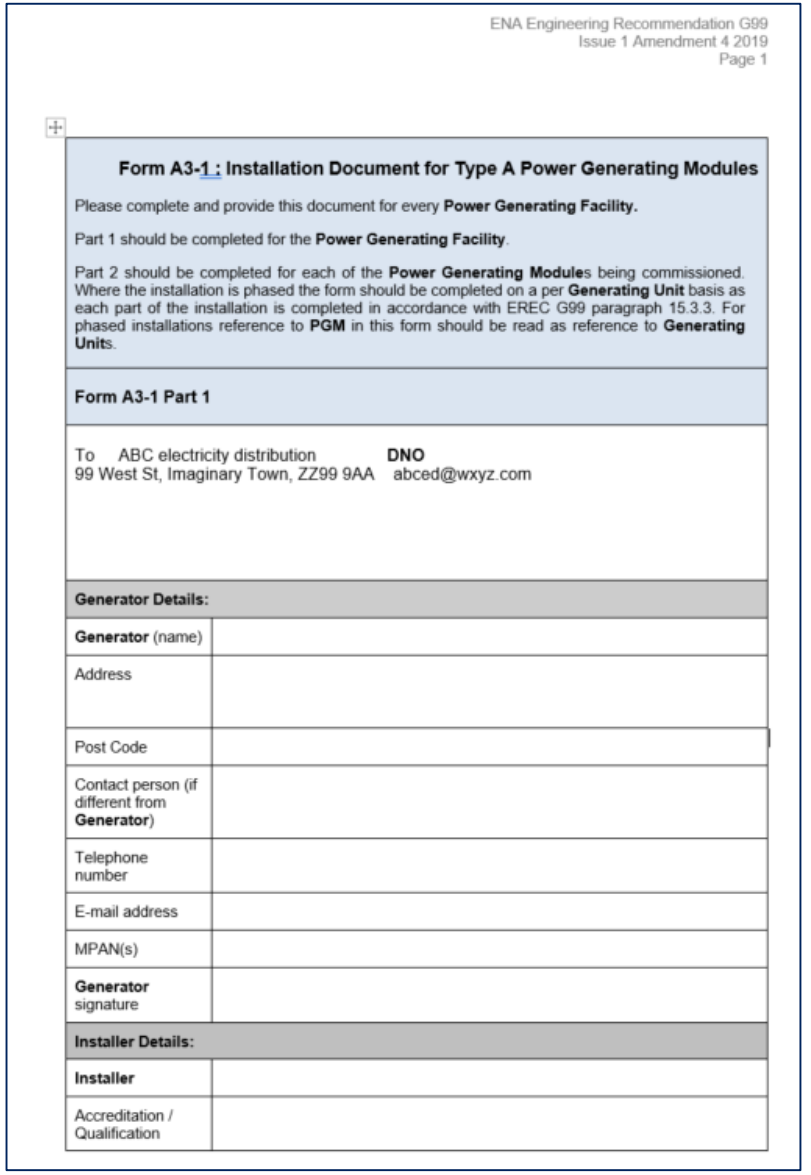
If the **Power Generating Module** is **Fully Type Tested** and registered with the Energy Networks Association (ENA) Type Test Verification Report Register, the Installation Document (Form A3-1 or A3-2) should include the **Manufacturer**'s reference number (the Product ID), and this form does not need to be submitted.

Where the **Power Generating Module** is not registered with the ENA Type Test Verification Report Register or is not **Fully Type Tested** this form (all or in parts as applicable) needs to be completed and provided to the **DNO**, to confirm that the **Power Generating Module** has been tested to satisfy all or part of the requirements of this EREC G99.

PGM technology			
Manufacturer name			
Address			
Tel		Web site	
E-mail			
Registered Capacity, use separate sheet if more than one connection option.		kW	

Form A3-1 - Notification Form

- Generator is likely to be in contact with our Design engineer's and they will organise with you all necessary aspects of the connection including G99 forms
- Submit **"Installation Document for Type A Power Generating Modules" G99 Form A3-1** within 28 days
- Send to ENWL Design Engineer



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Form A3-1 : Installation Document for Type A Power Generating Modules

Please complete and provide this document for every **Power Generating Facility.**

Part 1 should be completed for the **Power Generating Facility**.

Part 2 should be completed for each of the **Power Generating Module**s being commissioned. Where the installation is phased the form should be completed on a per **Generating Unit** basis as each part of the installation is completed in accordance with EREC G99 paragraph 15.3.3. For phased installations reference to **PGM** in this form should be read as reference to **Generating Units**.

Form A3-1 Part 1

To ABC electricity distribution **DNO**
99 West St, Imaginary Town, ZZ99 9AA abced@wxyz.com

Generator Details:	
Generator (name)	
Address	
Post Code	
Contact person (if different from **Generator**)	
Telephone number	
E-mail address	
MPAN(s)	
Generator signature	
Installer Details:	
Installer	
Accreditation / Qualification	

EREC G99 – Type A witness testing

- We may witness LV Type A PGMs in line with EREC G99 section 16.3

- Witness testing of Type A PGMs which are not fully type tested shall only be required where the generator does not provide complete commissioning records to demonstrate compliance with the relevant parts of G99.

- Generators shall be reminded that they are legally obliged under the ESQCR Regulation 22 to have appropriate equipment to prevent danger and interference to the distribution network.

EREC G98 and G99 Discussion

EREC G99 – Electricity North West's Next Steps

FAQs on website

EREC G98 & G99

webinars

on website

Meet with our experts

EREC G99 - Further information

➢ Electricity North West Website

https://www.enwl.co.uk/get-connected/new-connection/generation-connection/engineering-recommendation-g99

➢ ENA Website

http://www.energynetworks.org/electricity/engineering/distributed-generation/engineering-recommendation-g59.html

➢ DG Connection Guides

http://www.energynetworks.org/electricity/engineering/distributed-generation/dg-connection-guides.html

➢ Distribution Code DPC7

covers requirements for embedded generators including G99

http://www.dcode.org.uk/

EREC G99 - Over to you...

1) Do you now know what is expected of you?

2) Is there anything that is still unclear for you?

3) Is there anything more that you think we can do to help?

Your Post Acceptance Journey

Chris Fox

Bringing energy to your door

Stay connected...

www.enwl.co.uk

Our Commitment to you – 2019-20 DG LV ICE Workplan

Commitment:-

We will clarify the process followed after acceptance of a quote

Action:-

We will engage with stakeholders to review and improve the post acceptance process.

Output:-

We will publish the revised process as agreed with stakeholders

Stakeholder Engagement

- Reviewed existing guidance
- DG LV and DG HV Workshop
- Table discussions
- Feedback Forms

Your feedback

- Process Flow
- Easy access / links to Forms
- Access to the Team
- 1-2-1 assistance
- Checklist
- Worked Examples

Post acceptance – Available Guidance

G99 Form Summary

Guidance Table for G99 Applications	Less than 50kW	Integrated Micro-generation & storage (each up to & including 16 A per phase)	Greater than 50kW & less than 1MW (Type A)	1MW to less than 10MW (Type B)	10MW to < 50MW (Type C)	Greater than or equal to 50MW or >110kV (Type D)
Applicable Standard	G99	G99	G99	G99	G99	
Application	Form A1-1	Form A1-2	SAF	SAF	SAF	
Notification	Form A3-1	Form A3-2	Form A3-1			
Evidence	If not type tested – Form A2-1 synchronous <50kW, Form A2-2 synchronous >50kW or Form A2-3 inverter connected gen	If not type tested – Form A2-1 synchronous <50kW, Form A2-2 synchronous >50kW or Form A2-3 inverter connected gen	If not type tested- Form A2-2 synchronous & Form A2-3 inverter connected gen	PGMD Form B2-1	PGMD Form C2-1	
Compliance & Commissioning Checks			Form A2-4 if the Interface Protection is not Type Tested or for other site compliance tests	Form B2-2 if the Interface Protection is not Type Tested or for other site compliance tests	Form C2-2 if the Interface Protection is not Type Tested or for other site compliance tests	
Installation				Form B3	Form C3	

Post Acceptance Pack – Proposal

Post Acceptance Proposals

- Provision of ‘Post Acceptance Pack’ for HV and LV Connections
- Information to be included:-
  - What happens next
  - Contact information
  - Links to Forms
  - Links to useful information
- Continued access to the team to provide support – surgery sessions, ad hoc meetings etc

Feedback Discussion

1) Does this meet with your expectations?

2) What else would you like?

3) Would you like to see any further changes to our delivery lifecycle?

Question & Answer Session

Wrap up and Close

Mark Williamson

Stay connected...

www.enwl.co.uk

Wrap Up & Close

- Please give us your honest feedback on the forms provided
- Presentation slides will be available via our website shortly.
- Future events, including webinars are available here
- Don't forget to get in touch with us at ICE@enwl.co.uk
- Thank you for your attendance and have a safe journey home.