HEATMAP PROJECT INNOVATION CLOSE-OUT REPORT

PROJECT TITLE: HEATMAP PROJECT

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Start date: Q4, 2019. End date: Q2, 2020

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1. PROJECT SCOPE AND DESCRIPTION

ESB Networks is striving to provide stakeholders and customers with better information, insight and transparency. The Heatmap project is an important part of that drive; providing an indication of available capacity for new demand and generation customers.

The aim of the Heatmap is to provide an interactive map showing the available network capacity in terms of how much demand or generation could be added into a substation without reinforcement. It was envisaged that the Heatmap would be published on ESB Networks website and would help potential customers have a better understanding as to where to connect. The first phase will represent transformer capacity at 38 kV and MV stations.

The map will include:

i. Location of substations[1] – Interactive filters provided to switch between voltage levels.
ii. Capacity available at each substation - colour coded markers for levels of available capacity with interactive filters to allow users switch between markers/available capacity ranges.

2. MEASURES OF SUCCESS AND EXPECTED BENEFITS

Around 60-70% of the applications received for renewable generation don't accept the connection offer supplied for their first application. Significant ESB Networks resources are required to process modified generation applications. It is expected that the Heatmap would assist customers to identify areas where capacity is available and reduce the overall modifications submitted.

The Heatmap will provide customers seeking new demand connections or increases to existing connections with a high-level overview of the level of capacity available in an adjacent HV substation. ESB Networks' demand customer connection planning team receive high level requests about available capacity in regions; it is expected that the Heatmap will assist customers to identify available capacity themselves. (Note: the Heatmap should not be considered to be a hosting capacity map as it only deals with transformer capacity and the latter is extremely sophisticated and gives a holistic answer taking into account all plant capacities and operational requirements)

The publication of the map would be strongly in line with the 2030 Governments strategy of connecting 70% Renewables, the Regulator's expectations as well as ESB Networks' strategy of Innovating for a Brighter Future.

3. RESULTS

The Demand and Generation Heatmaps were published in May 2020 on ESB Networks website at the following links;

- https://www.esbnetworks.ie/demand-availability-capacity-map
- https://www.esbnetworks.ie/new-connections/generator-connections/generation-availability-capacity-map

[1] for security reasons only approximate locations of HV substations are provided.

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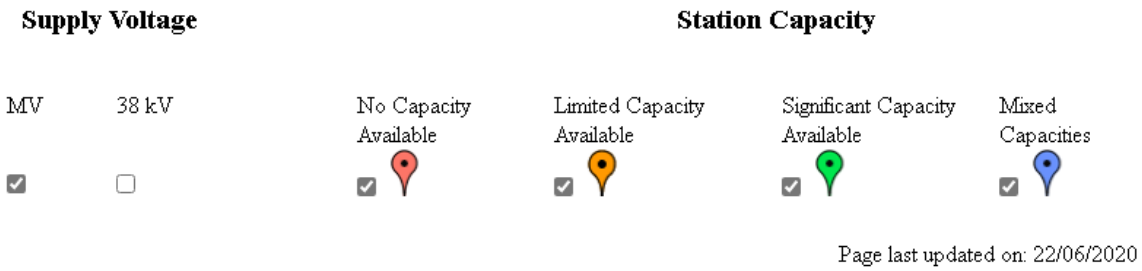
FIGURE 1: DEMAND HEATMAP AND GENERATION HEATMAP SELECTION OPTIONS



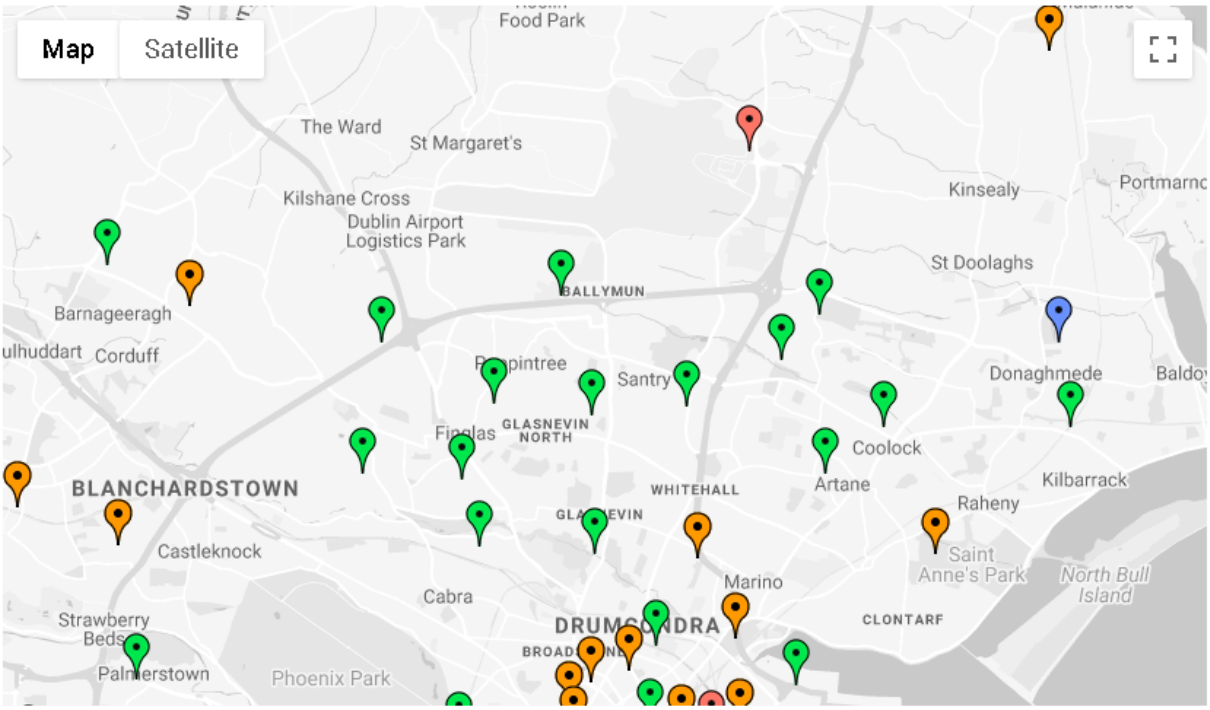


FIGURE 2: DEMAND HEATMAP LAYOUT SHOWING VOLTAGE AND MARKER FILTER OPTIONS

The interactive maps provide customers and stakeholders with a high-level overview of available transformer capacity at each MV and 38 kV station for new demand and generation applications. Users can filter based on voltage level and range of capacity available at station transformers.

4. LEARNINGS AND RECOMMENDATIONS

The publication of the Heatmap allowed ESB Networks to share significant information with customers and stakeholders in a user friendly and interactive manner. Traffic on the website was monitored to assist in the next update.

Feedback was sought from internal and external stakeholders on layout, ease of use, level of information provided and suggestions for future improvements. Many external stakeholders requested additions to the webpage, for example, information displayed on the map be available to download in a downloadable excel file format. This feedback and suggestions will be taken on board for the next update.

The published current map does not facilitate the clustering of a large number of data points. ESB Networks internal IT team will develop the ability to cluster data points, this will take some months. An alternative third party will be investigated to cluster data points in the next phase update until the internal facility is developed.

5. BENEFITS REALISED AND DISSEMINATED

In May and June 2020, a link to the new Heatmap webpage was circulated to an external stakeholder distribution list via email and a general notice was posted on various social media platforms which included the weblink. In July 2020 ESB Networks successfully hosted a live webinar for external and internal stakeholders to disseminate the key features of the Heatmap. An online presentation was given by the ESB Networks subject matter expert covering an overview of the Heatmap, the purpose of the Heatmap, how the capacity values are calculated and next steps for the project. The webinar also hosted presentations associated with the upcoming Enduring Connection Process 2 generation application submission deadline.

The webinar allowed for the submission of questions by participants which were answered by the relevant ESB Networks presenter. All questions and comments posed during the webinar were later collated with more complete answers and circulated to the wider external stakeholder group along with a copy of the presentation slide deck. The webinar was well attended by a diverse range of key stakeholders; 69 participants from Academia, Renewable Generators, Demand Side Units, IT Suppliers, Energy Consultants, Government Bodies and other stakeholders.

The Heatmap webpage also has a contact email address for general questions which has received a number of queries. This has been very useful in directing the queries more efficiently to the relevant team in ESB Networks to provide a direct response to the customer in a timely manner.

6. FINAL TIMELINES

The project delivery programme ran from December 2019 to June 2020.

7. FINAL COSTS

No CAPEX costs were incurred with this project. Time and expenses for ESB Networks Staff were utilised to realise the publication of the Heatmap.

8. NEXT STEPS – BAU / TRANSFER OF OWNERSHIP

The next update of the Heatmap will include the regular update of generation information based on the most up to date load information (Special Load Readings) and contractual commitments. Improvements in the layout and wording will be implemented based on the feedback and comments from key stakeholders. Additional information will also be provided with the planned publication of information at 3-phase LV substations throughout the country. The inclusion of LV substations will greatly increase the number of information points shown on the map; data clustering functionality will therefore be required and may be utilised the third party service mentioned. In addition to the interactive map, the underlying data will be made available for download.

The ownership and continued maintenance of the Heatmap will remain with the Planning Delivery Team section of the Distribution Planning and Customer Access Team. The generation information will be updated on a quarterly basis and the demand information once annually.

If you would like further information/data from this project, please contact us at innovationfeedback@esbnetworks.ie