Project Initiation Document for the Residential Consumer Demand Response Programme

DOCUMENT CONTROL

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V1	04/04/2016	First Review	Teresa Fallon
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DOCUMENT REVIEW

Role	Name	Date
Project Executive		
Senior Supplier		
Senior User		
Project Manager		

DOCUMENT APPROVAL

Name	Role	Date
Project Board	Project Board	

Contents

1. INTRODUCTION

1.1 Purpose of this Document

This document is the Project Initiation Document (PID) for the Electric Ireland's approach to deliver a Residential Consumer Demand Response scheme as per agreement with EirGrid Plc.

Some key objectives of this PID are to provide:

- Details on the overall approach that will be taken by Electric Ireland in order to deliver the scheme to EirGrid including the project scope, business objectives and management approach;
- A description of the roles and responsibilities of the Electric Ireland Project Team;
- A reference document for project staff and stakeholders on the processes that the Project Board and Innovation team expects to be performed;
- A baseline for the project against which all parties will operate.

The PID belongs to all project team members. It is everyone's responsibility to follow the practices and methods described and to contribute new ideas and means of achieving project goals.

The document is subject to periodic reviews throughout the lifecycle of the project. Updates, amendments, additions or deletions to the PID are subject to change control and to the approval of the project board.

1.2 Background to the Residential Consumer Demand Response Scheme

The integration of Demand Side Management (DSM) is an important component of the European Union's transition towards a low carbon economy. At the European Union level DSM is firmly grounded in the 2009 Electricity Directive and the 2012 Energy Efficiency Directive (EED) and is expected to feature as a key part of the energy system on the road to 2030. The Irish government has also recognised the potential of DSM and is committed to exploring opportunities in the sector.

The growth of DSM in Ireland is undergoing rapid change largely driven by these EU and national policies. However, this recent growth has focused on commercial and industrial loads only. Given the proportion of total demand that is made up of residential consumers in Ireland there are real potential benefits from capturing the value of residential DSM and enable residential customers to contribute, and get rewarded for this contribution, to EirGrid's delivery of a stable electricity system.

In order to stimulate growth and innovation in residential consumer based DSM, EirGrid decided to run an industry wide competition to have a residential consumer based demand response project in operation, starting in 2016. Electric Ireland were chosen as the Preferred Supplier to deliver the scheme, which will aim to provide a minimum of 2 MW and a maximum of 5 MW of demand response[1]. EirGrid is responsible for ensuring day-to-day operational security of the power system and this scheme will act as a pilot for this evolving space and help encourage and support technological innovation in this sector. The project will last to March, 2018, the scheme will end at the end of 2017.

[1] On the basis of anticipated demand response capacity of 3.5kW per home as per EirGrid Tender Request

1.3 Objectives of the Project

The objective of this project is to establish and operate a residential consumer based demand response project over the course of 2016 and 2017. The scheme will aim to provide a minimum of 2 MW and a maximum of 5 MW of demand response, involving up to approximately 1,400 residential homes.

The following are the high level objectives for this project:

A. To establish and operate a residential consumer based demand response scheme over the course of 2016 and 2017, recruiting and engaging the targeted number of customers with no adverse affects on their comfort at home due to their involvement in the scheme, which will be achieved by:

   - Equipping a targeted number of the customers with an innovative new Smart Energy Controller that will provide customers with their real time electricity usage and provide controllability through smart plugs on energy intensive appliances.

   - Equipping a target of 200 customers with new smart hot water control equipment in the form of either cylinders (as a total replacement of existing cylinder) or retrofit smart controllers on hot water cylinders (for those who do not need/wish to have a total replacement).

   - Extending participation to our growing Smart Pay-As-You-Go customer base and testing demand response through a messaging service as the interval data will provide a means for measuring electricity consumption being reduced following an demand response event.

   - Providing a flexible cost effective messaging and Service solution with appropriate performance monitoring solutions.

   - Establishing the end to end processes required to run the trial demand response scheme to provide learnings for an enduring Residential Demand Response Scheme.

B. To incentivise customers to take part in the demand response events, testing their attitude to such as scheme and their willingness to participate in demand response events.

C. To carry out professional consumer research to seek customer behavioural insights into manual vs automatic controllability of technologies, acceptability of new smart technologies, including customer willingness and capacity to change their consumption behaviour in response to various signals or incentives.

D. To provide a Project Progress Report at least every six months.

2. PROJECT DEFINITION

2.1 Project Approach

In order to establish the scheme, Electric Ireland will extend and enhance the current Smarter Living Programme, which involves an existing panel of 600 customers who are already testing Smart Home technologies, providing valuable feedback and learnings for Electric Ireland through ongoing research and communications. This also includes existing Smart Pay as You Go customers. Any new recruitment will be an extension of both panels by recruiting from existing Electric Ireland customers who have given Electric Ireland permission to market to them. There may also be recruitment from people that have expressed interest in taking part in the project that have satisfied the suitability criteria for certain technologies to be installed and are already an Electric Ireland customer or are willing to be an Electric Ireland customer for the trial.

The scheme will be developed in a number of phases, where new technologies or capabilities will be established as part of a phased approach to increase the customer numbers and test different use cases for the delivery of demand response. These phases can be summarised below and overleaf. On an ongoing basis for the duration of the trials, the project will carry out robust behavioural and cost analyses to identify the most effective demand response technologies for different customer categories. Also at a maximum of every six months, the project will publish a progress report which will provide an update on progress to date for the scheme.

Phase 1 – Mobilise the Scheme

This phase will involve the drafting and agreement of the PID (this document), the customer engagement plan, the EirGrid Electric Ireland legal agreement and the processes for delivering of the demand response services.

Phase 2 – Smart Energy Controller

Members of Electric Irelands Smarter Living panel are being equipped with a Smart Energy Controller, which will provide real time energy usage and cost information via a smartphone app and the ability to remotely control and schedule appliances from the application. This is achieved by equipping each customer with a smartphone app, in-house communications, three or more smart plugs installed on energy intensive appliances (e.g. tumble dryer, dishwasher, washing machine or other). Also the total household electricity consumption and the separate monitoring of the immersion heater circuit is available through the app.

For Phase 2, this Smart Energy Controller will be modified to provide a demand response solution for the scheme, which can provide alerts to customers notifying them of a demand response event and providing central control for Electric Ireland to switch on or off appliances centrally, from the system, using the smart plugs deployed in each house.

This phase will include:

- the establishment of an Electric Ireland Service to communicate with EirGrid on demand response availability and dispatch and issue demand response requests to customers via messaging / texts;
- Upgrading of the messaging approach to a customer to take demand response action (thereby achieving customer consent and response information);

The end of this phase means an operational Go-Live date as the initial customers will have been signed up trial out demand response.

Phase 3 – Extend the scheme by recruiting additional Smart Pay As You Go customers to participate in the scheme

For Phase 3, Electric Ireland will extend the demand response capacity by supplementing the customer base with additional Smart Pay As You Go customers recruited to participate in the demand response project. These customers provide smart meter level data at half hourly metering currently with the potential to provide 15 minute granularity and communications which will enable measurement of the demand response achieved. This will provide important insights on the capability of delivering such a service ahead of the planned roll out of the National Smart Metering Programme.

Phase 4 - Smart Energy Controller extension to control immersions

In Phase 4 the Smart Energy Controller will be extended to also control existing immersion water heater in a number of the homes where the system will be already installed. This will extend the capabilities of the Smart Energy Controller to provide immersion control remotely as well as control of appliance through the smart plugs.

Phase 5 - Glen Dimplex Smart Hot Water Control & DSM

Electric Ireland will invest in and install Glen Dimplex smart Quantum Cylinders (together with Connected Home facilities)

Phase 6 - Extension of the scheme through deployment of the Climote Smart Hot Water DSM

Phase 6 will involve the installation ofClimote Smart Hot Water DSM controllers. This will also test demand response as a retrofit hot water control solution, providing similar control to the Glen Dimplex and the Smart Energy Controller immersion control solution.

Phase 7 - Extension of the scheme through recruitment of E-Vehicle and Micro generation technology owners.

If required, a number of Electric Vehicle and Micro generation Scheme Customers may be added to the programme as a means of testing the demand response capability of these emerging customer segments.

Phase 8 - Collation of final learnings from the trial & Project Closedown

The final phase of the project will be to close down the scheme and provide a report summarising the operation of the scheme and the results of the analysis over the course of the project.

Table 1: Proposed components of different customer types and technologies for Electric Ireland proposal.

	Component of Overall Demand Response Programme	Target No. of Customers	Projected Timeline for Availability	Demand Response Potential (kW)*	
Phase 1	**MOBILISE PROJECT**				
Phase 2	Smarter Living Panel customers with Smart Energy Controller			1,925	
Phase 3	Smarter Pay as You Go Customers			1,890	**OPERATIONS PHASE – ONGOING FROM PHASE 3 THROUGH TO PHASE 8**
Phase 4	Extension of Smart Energy controller to control immersions			350	
Phase 5	Glen Dimplex Hot Water Control & DSM			350	
Phase 6	Climote Hot Water Control & DSM - plus Smart Energy Controller			350	
Phase 7	Electric Vehicle[2]			TBC-estimate 122.5	
[AS REQUIRED]	Existing Customers on Electric Ireland Micro generation Scheme (includes Solar PV & Wind) [1]			TBC - estimate 122.5	
Phase 8	**Collation of Project Learnings and PROJECT CLOSE DOWN**				
Total		**1,430 Customers**		**5,110 kW**	

* (based on EirGrids estimation of 3.5kW per Customer)

Table 1 provides a breakdown of the different customer types and technologies that are proposed by Electric Ireland to participate in the EirGrid's DSM Project aimed to satisfy the target of 5MW.

[2] A number of Electric Vehicle and Micro generation Scheme Customers may be added to the programme as a means of testing the demand response capability of these emerging customer segments.

2.2 Key Deliverables

The following table summaries the key deliverable for each stage of the project:

Stage	Key Deliverables
Phase 1	**Project Mobilised:** • Agreed PID • Signed Contract • Agreed Customer Communications Plan • Agreed end to end process • Project operational payment schedule
Phase 2	**Modified Smart Energy Controller providing an end to end demand response solution for the scheme:** • Ability to notify customers of a demand response event and to provide central or participating customers using the smart plugs deployed in each house. • The establishment of an Electric Ireland Service to communicate with EirGrid on demand response availability and dispatch and issue demand response requests to customers via messaging / texts; • Upgrading of the messaging approach to customers to take demand response action.
Phase 3	**Smarter Pay as You Go Customers recruited and text messaging system in place to test demand response service through this approach.**
Phase 4	**Extension of Smart Energy Controller to control immersions:** • Smart Energy Controller capability extended to include immersion control switch capability •
Phase 5	**Glen Dimplex Quantum Hot Water Cylinder installed in a number of select homes:** • Glen Dimplex will develop a number of smart hot water cylinders that will have DSM capability.
Phase 6	**Climote Hot Water Control & DSM control:** • Climote are developing a Smart Hot water immersion switch
Phase 7	**Addition Electric Vehicle or Micro Generation homes recruited and signed up to the scheme as required.**
Phase 8	**Project Close Down Report**

2.3 Constraints

The following items are key constraints that will affect the delivery of the project:

Resources and Budget:

The project team has finite resources and budget to deliver the project. The resource's and budget allocated are sufficient to deliver the plan as described in this document, this will be monitored on an ongoing basis and any risks or issues will be reported to the project board.

Timeline:

The timeline for execution on the project is ambitious, it will be critical that decision key processes are designed or adapted to be deliverable in the required timeline and that any decision or signs off required during the project are made quickly and inline with the time line to ensure that the deliverables are achieved at each stage of the project.

It must be noted that there are external dependencies required as part of the overall delivery of the project and although the project will take all reasonable steps to ensure that these deliverables are achieved the delivery of the project is contingent on their service being delivered.

Technology:

Lead time on hardware can take up to 12 weeks in some instances and platform development can take longer than this. Electric Ireland are confident that the proposed project timeline is deliverable, however it should be noted that additional hardware items or process changes may have time, cost and installations implications.

In some instances, the project may identify that the technology chosen for deployment as part of this project may need to be modified to meet the requirements of new use cases or processes. Such use cases or processes may only be discovered as the detailed end to end process design is completed in Phase 1 or when the trial is underway and learnings are being identified. Requirements of such changes will need to be assessed from a cost and timeline perspective.

Involvement of Customers:

A detailed customer engagement plan will be developed, however, customer involvement cannot be guaranteed and the project will be constrained by willingness of customers to engage with the service. Electric Ireland do already have a customer research panel of 600 customers who are very engaged with current smart technology trials, however at all time the comfort of end customers will not be impacted by the project and therefore their involvement cannot be taken for granted. Electric Ireland will have incentive mechanisms in place so that customer involvement can be maximised.

Ongoing Business as Usual for EirGrid and Electric Ireland:

The project will need to take into consideration the fact that both EirGrid and Electric Ireland have significant ongoing operations including communications with customers and the general public. At all times, communications relating to the Residential Consumer Demand Response Scheme must be clear and separate from any other communications from either company.

Communications

In terms of communications constraints, our third party providers will be using communication protocols such as end customer broadband connection, Zigbee, Z-Wave and 868 radio frequency. In the event of performance issues with these communications between the gateway and the technology Electric Ireland will ensure that their third party providers will provide assistance and support in line with existing Service Level Agreements in order to facilitate communications breakdown and rectify any issues that may arise as soon as possible.

All solutions being deployed will have support of the Third Party Supplier and Electric Ireland teams to ensure that communication to the system is maintained appropriately. The Smarter Energy Controller and the Smart PAYG solutions are already deployed in the field and working with very minimal communications issues.

ESB Networks (DSO) Congestion

Given the nature of this project and the dispersion of the population and size of the technology devices being implemented, it is envisaged that there should be none or very minimal potential congestion issues involved. Electric Ireland will discuss potential congestion issues with the DSO and arrange a mitigation actions, if necessary.

2.4 Assumptions

The following items are key assumptions on which the timeline for the project delivery is based:

Demand Capacity per customer:

The available demand capacity per customer has been assumed to be 3.5kW per customer as per EirGrid Tender Request – therefore the 5MW Demand Capacity requirement will be delivered through the sign up engagement of 1,430 customers.

Notice for operation outside normal working hours will be provided:

Electric Ireland will put in place a system that has the ability to manage a demand response event at any time from the Electric Ireland Service, EirGrid would be required to provide notice if the services are required outside normal working hours. This would be a more cost effective operation than a continuous 24/7 operation at this stage and would offer the same capability to plan and test the service at different times.

At least 2 events will be scheduled and monitored for the required participation necessary to trigger the early bonus of 0.5MW (equating to 143 customer on the basis of 3.5kW demand response available per customer).

2.5 Interfaces

The key interfaces of the scheme are set out in the following infographic. The key interface and communication steps at each interface can be summarised as follows:

Interface 1 – DR Signal:
EirGrid send signal for demand response event to Electric Ireland:

This signal can be in the form of an email to the project manager and dedicated team members or phone call followed by email if EirGrid wish to take this approach. Electric Ireland can provide a dedicated contact phone if required.

Interface 2 – DR message to customers:
Electric Ireland send notification of demand response event to customers via three different systems:

a) Accenture Platform for in-app communication using Smart Energy Controller
b) SMS communications system for text messaging to all customers
c) Glen Dimplex Platform for in-app communication using Glen Dimplex Quantum Hot Water Controller App

Electric Ireland will send a demand response signal to Accenture using their Smart Energy Controller and Glen Dimplex using their smart hot water Quantum Cylinders. Both Accenture and Glen Dimplex will use their own Gateways and 'In App' messaging.

It is envisaged that within 5 minutes of a signal being sent from EirGrid to Electric Ireland, an in app message will be sent from Electric Ireland's team to customers via the Accenture and Glen Dimplex Platforms.

In addition, a text message will be sent to all customers from each phases by the Electric Ireland team using an SMS messaging solution. This system will be used to notify three additional components that will add to the demand response scheme. These are:

a. Climote – will contribute to demand response by using a retrofitted immersion controller. Data collection and reporting will be provided.
b. Smart Pay As You Go – this customer segment will contribute to demand response events as a whole. Messaging will be provided by Accenture in the form of SMS. Data collection will be collected, analysed and reported upon by Electric Ireland's Business Intelligence.
c. Additional Customers can be recruited if required from electric vehicle and micro-generation customer segments.

The timescales will be dependent on the level of manual and automated controls with each technology component. In relation to the manual components, the timescales will depend on the customer interaction. It is estimated that this could range between seconds to minutes, part of the learning of this project is to determine the response time for customers and to see how they will change their behaviour to partake in the demand response event, the confirmation by customer to opt-in using the SMS system in combination with the metering system provided by the smart energy controller will provide a very good indication of how customers actual demand changed after they confirmed that they would act on the request.

Preconfigured notification and messages will be setup on each of the systems to make it easy to quickly issue the notifications to customers.

Step Number	Step Description	Process to be carried out	How this happens?	How Long will it take?
1	**EirGrid send Signal to Electric Ireland**	Email / Phone Call followed by email	**EirGrid send the message directly to Electric Ireland circulation list and call dedicated phone number.**	**Estimating Seconds (less than 1 minute)**
2	**Electric Ireland send message to customers to requesting that they reduce their demand**	**1:** Electric Ireland send message to Smart Energy Controller Customers using the SMS system and/or in app notification **2:** Electric Ireland send message to Smart PAYG Customers using the SMS system and by messaging the in home display (IHD) in the customers home **3:** Electric Ireland send message to Glen Dimplex Quantum Cylinder Customer using the SMS system and/or in app notification **4:** Electric Ireland send message to Climote Hot Water Control Customers using the SMS system **5:** Electric Ireland send Signal to Other Customer (EV's/ Micro Gen) using the SMS system	**Electric Ireland access the communications systems and send a predetermined message to each group of customers. All customers receiving an SMS will receive this in one batch as all SMS messages will be sent from the same system.**	**Less than 5 minutes is estimated** (this is expected to take approximately 1 to 2 minutes, the exact timeframe will be determined through Electric Ireland tests when the communications system is mobilised and this will be communicated to EirGrid at that stage. It should take less than 1 minute to access the systems and trigger the messages).

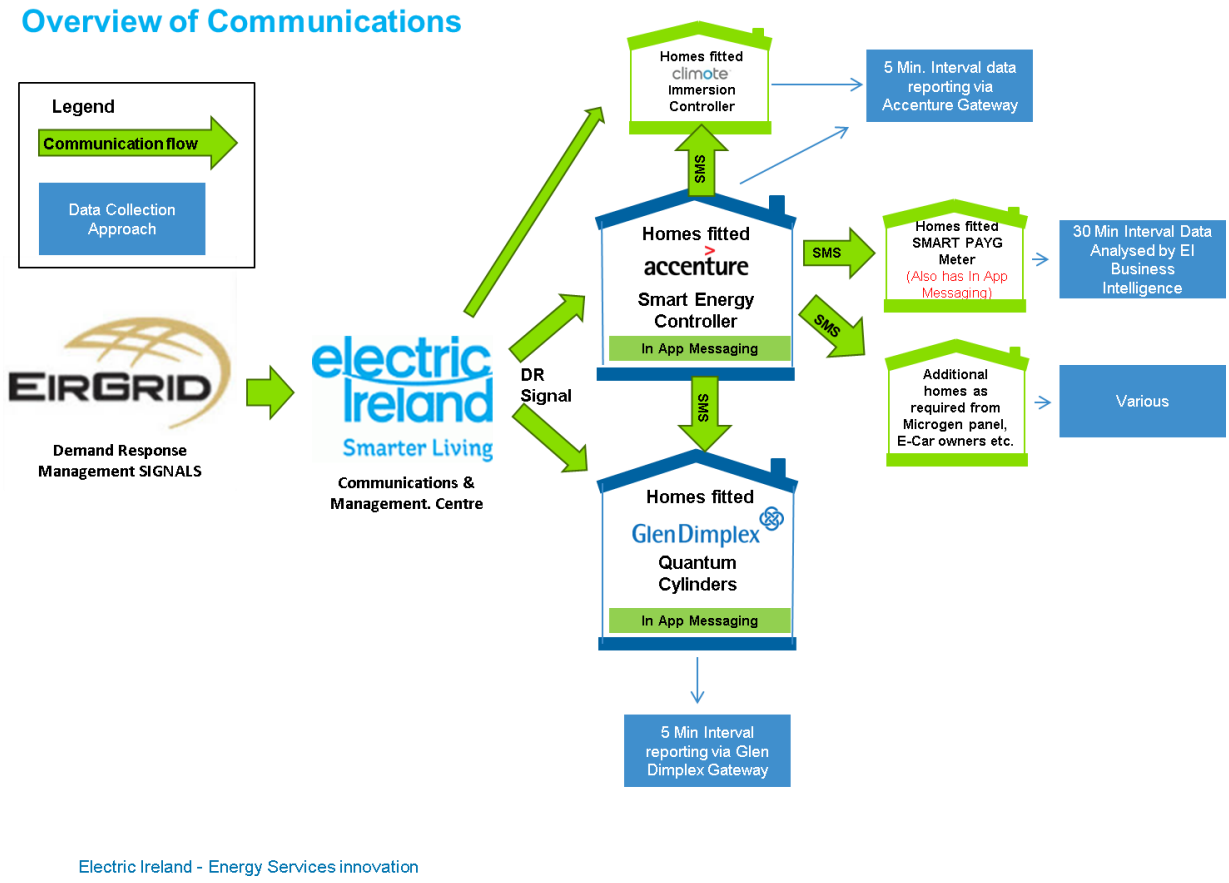
Step Number	Step Description	Process to be carried out	How this happens?	How Long will it take?
3	**Electric Ireland turn off the equipment in customers homes via the direct control provided from the systems in place that are giving central control to Electric Ireland.**	**1:**Electric Ireland use the control platform to send the signal to Smart Energy Controller unit in customers homes to turn off smart plugs that are opted-in for demand response control. All of the opted-in plugs will be switched off when the signal is sent. **2:** Electric Ireland use the control platform to send the signal to the Glen Dimplex Quantum Cylinders installed in customers homes to turn off any units that are currently turned on **3:** Electric Ireland use the control platform to send the signal to the Climote Hot Water Switches installed in customers homes to turn off any units that are currently turned on	**Electric Ireland will access the control systems and send the control signal to each unit in customers homes. This will issue via a single instruction (i.e. a click a button on the system).**	**Less than 5 minutes is estimated** (it takes approximately 3 to 5 second for a control signal to issue from the app to a smart plug and therefore it is expected that this control step will take approximately 1 to 2 minutes in practice to switch off all of the units turned on. The exact timeframe will be determined through Electric Ireland tests when the master control functionality is mobilised and this will be communicated to EirGrid at that stage).
4	**Electric Ireland will monitor the communications and operations for the duration of the event**	**Electric Ireland will monitor the event for the duration of the event, corresponding with any customers that may contact Electric Ireland regarding the event. Monitoring performance on the systems and interactions via the SMS system and in app notifications**		**20 Minutes**
5	**Electric Ireland will send an end of event message**	**Electric Ireland will message all customers at the end of the event to thank them for their participation, informing them that the event is over . Electric Ireland will also tell those customers who had smart plugs turned off that the plugs can now be turn back on and that it is up to the customer to do so.**		**Less than 5 minutes**

Interface 3 – Metering from each component:
Each of the components will meter the energy usage, the meter data will be collected at the intervals described in the table overleaf.

Component	Meter data interval
Smarter Living Panel customers with Smart Energy Controller	5 minutes
Smarter Pay as You Go Customers	30 minutes*
Extension of Smart Energy controller to control immersions	5 minutes
Glen Dimplex Hot Water Control & DSM	5 minutes
Climote Hot Water Control & DSM - plus Smart Energy Controller	5 minutes
Electric Vehicle	TBC
Existing Customers on Electric Ireland Micro generation Scheme (includes Solar PV & Wind)	TBC

* Electric Ireland will explore the possibility of metering Smart Pay as You Go customers at 15 minute intervals. if this is not possible, 20 Smart Pay as You Go homes will have the Smart Energy Controller installed as a subset that can be metered at 5 minute intervals.

2.6 Communications between EirGrid, Electric Ireland and demand response mechanisms



Electric Ireland - Energy Services innovation

A signal will be sent to Electric Ireland to commence a demand response event. Electric Ireland will have backend access to two platform, namely, Accenture and Glen Dimplex. In the Accenture platform, Electric Ireland will have the capability to send out push messages to customers with the Smart Energy Controller App requesting them to switch off appliances. In addition, via the Accenture platform, a text message notification will be sent out to all customers involved in this Residential Consumer Demand Response Trial. Separately, Electric Ireland will have back end access to the Glen Dimplex Platform and a push notification will be sent out through their app. In summary, it is envisaged that the signal will sent to all customers within 5 minutes after signal arrives in from EirGrid as these can be prepared in advance prior to the demand response event.

In terms of the customer receiving a signal via push messages, it is envisaged that both Accenture's and Glen Dimplex platform will have the capability to derive the amount of customers that have either responded on time or not.

It is envisaged that once the demand response event has occurred, there will be a text sent to each customer to notify them on either the overall result or their individual results on their contribution to reducing demand when requested. Please note that this is the planned approach at this stage, a detailed process flow diagram will be developed and the exact final approach will be finalised to provide the best overall experience for customers and to deliver the most effective demand response service achievable within the constraints of the technology.

2.7 External Dependencies

Key elements of this project will be delivered by outsourced/Third party suppliers/partners. Electric Ireland will put in place a programme of work with these partners reflecting the contents of this PID and will work with these partners to ensure a well managed project and mitigate risks of delays in delivery or cost over-run.

- Third party suppliers, including:
  - Accenture
  - Glen Dimplex
  - Climote
  - Research Agency
  - Communications with technologies

- In addition the project will be dependent on key stakeholders, who will be required to support is required for the delivery of the project:
  - Customers
  - ESB Networks (DSO)
  - CER

2.8 Benefits

In terms of the overall benefits of demand side management, this project supports:

1. European and National energy efficiency policy and targets
2. Demand Connection Code
3. National Energy Efficiency Action Plan for Ireland
4. Power System – potential for greater accommodation of intermittent renewables, enhanced generation adequacy, reduced system/consumption costs and potential for avoided / deferred network investment;

There are many benefits in carrying out this Residential Consumer Demand Response Project. The key ones are:

- Understanding of:
  - residential consumer behaviour and insights
  - capabilities of technologies proposed
  - preferred incentive mechanism
  - preferred and most effective communications with the consumer
  - customer journey

- Consumer – reduced bills, greater control over and engagement with the energy they produce and consume.

In addition to the Glen Dimplex Quantum hot water cylinder, this product can support demand response and provide both important control over electricity usage and the potential to enhance the extent and range of System Services delivered. This could potentially deliver different classes of operating reserve and frequency response and perhaps also, in the future, a ‘demand increase’ service to facilitate greater priority dispatch and reduce curtailment.

2.9 Risks

The following items are key risks that will affect the delivery of the project:

- **Time delay caused by technology providers not being able to deliver on schedule:**
  Plans are in place at present and technology suppliers have committed to delivery against these plans. Milestones will be identified to ensure that suppliers are on track to deliver against plans and regular updates will be provided to the project board.

- **Difficulty recruiting customers:**
  550 customers are already in place and have Smart Energy Controller installed. Detailed recruitment processes will be drawn up for each additional phase of the project and Electric Irelands specialist marketing and customer communications teams will manage the recruitment of additional customers for the scheme. In the instance where it is proving difficult to recruit customers using certain technology components, Electric Ireland will seek additional participation from other technology components so that sufficient customers numbers can be reached to take part in demand response.

- **Data protection management issues:**
  ESB IT security have already tested all existing technology being used for delivery of the trials. Ongoing security reviews and tests will be carried out to ensure that data protects is prioritised throughout the project.

- **Process issues:**
  The development of end to end processes will be prioritised in phase 1 of the project to ensure that EirGrid and Electric Ireland have a clear common understanding of the end to end process that will be put in place to deliver the demand response service.

- **Technology failure:**
  The scheme is planned so that a number of different technologies and technology suppliers are involved in the delivery of the overall solution. This combination of different technologies and supplier provides redundancy by reducing reliance on a single supplier or technology. Plans are agreed with each supplier and sufficient lead time is provided for in the project plan to deliver each phase of the project.

- **Communications failure**

  Electric Ireland will ensure that their third party providers will provide immediate assistance and support in order to facilitate communications breakdown and rectify issues as soon as possible. Third party providers will have an obligation from the Service Level Agreement and to date, we have had very minimal communication failure to technology that is already deployed. Example issues that arise with regard to communications can include:

  - Plug is unplugged
  - Internet is down
  - Gateway is offline
  - SMS network and data network
  - Phone being turned off / out of coverage

- **ESB Networks (DSO)**

  Given the nature of this project and the dispersion of the population and size of the technology devices being implemented, it is envisaged that there should be none or very minimal potential congestion issues involved. Electric Ireland will discuss potential congestion issues with the DSO and arrange a mitigation actions, if necessary.

3. Project Plan

A detailed project plan is provided overleaf. Our proposed approach means that the project is deliverable with the timeframe outlined by EirGrid. The key milestones on the proposed project plan can be summarized as follows:

- [redacted] - Sign Agreement with EirGrid
- [redacted] 2016 EirGrid End-to-End DR Trial, Electric Ireland target to have over 1,090 Consumers signed up (Minimum commitment for project >0.5MW or 143 Consumers),as per EirGrid Tender request
- [redacted] - EirGrid End-to-End DR Trial, Electric Ireland target to have over 1,290 Consumers signed up (Minimum commitment for project >1MW or 286 Consumers),as per EirGrid Tender request
- [redacted] - EirGrid End-to-End DR Trial (5 MW Capacity or 1,430 Customers)

Residential Demand Response Project Plan

3.1 Deliverables

The following high-level deliverables have been identified:

Deliverable ID	Name
1	Project Initiation Document (PID)
2	Detailed Consumer Engagement Plan
3	Contract Signature
4	1st Project Progress Report
5	EirGrid End-to-End DR Trial, Electric Ireland target to have over 1,090 Consumers signed up (Minimum commitment for project >0.5MW or 143 Consumers)
6	2nd Project Progress Report
7	EirGrid End-to-End DR Trial, Electric Ireland target to have over 1,290 Consumers signed up (Minimum commitment for project >1MW or 286 Consumers)
8	3rd Project Progress Report
9	EirGrid End-to-End DR Trial (5MW or 1,430 Consumers)
10	Close Down Report

3.2 Milestones

The key milestones from the project plan can be summarized as follows:

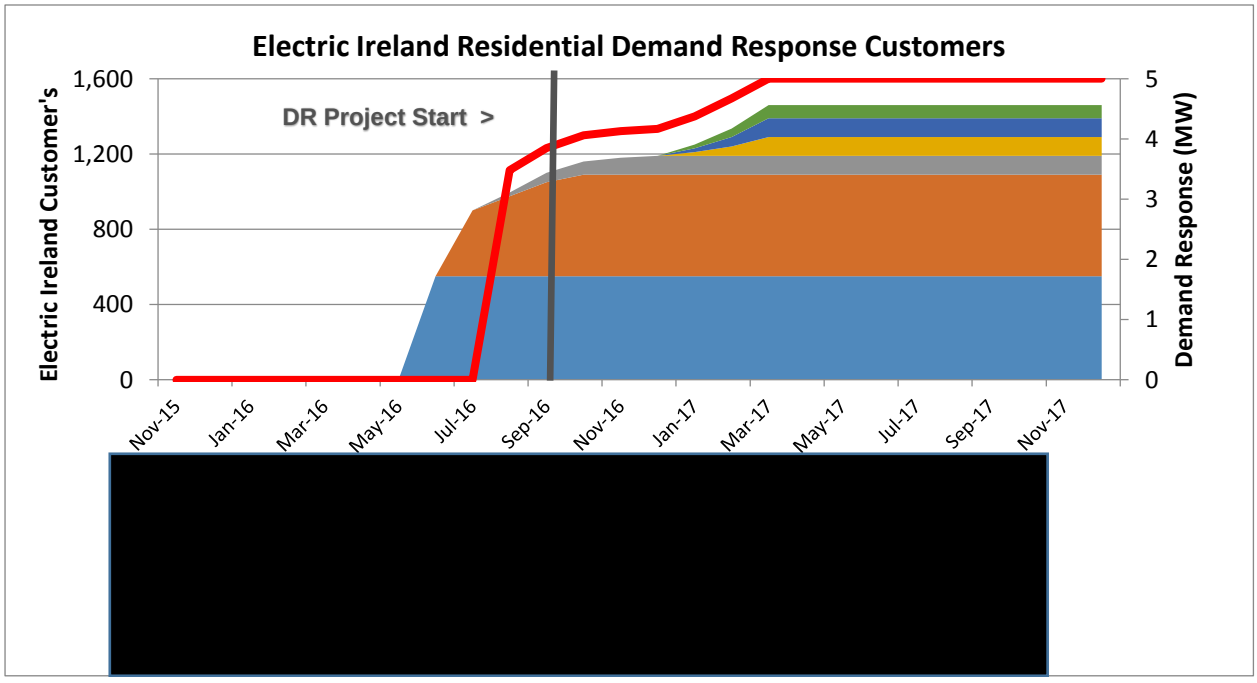
- [redacted] – Publish Project Initiation Document
- [redacted] – Agree on Service Communication
- [redacted] – Publish 1st Project Progress Report
- [redacted] – EirGrid End-to-End Trial, Electric Ireland target to have over 1,090 Consumers signed up (Minimum commitment for project >0.5MW or 143 Consumers*)
- [redacted] – Publish 2nd Project Progress Report
- [redacted] - EirGrid End-to-End DR Trial, Electric Ireland target to have over 1,290 Consumers signed up (Minimum commitment for project >1MW or 286 Consumers*)
- [redacted] – Publish 3rd Project Progress Report
- [redacted] - EirGrid End-to-End DR Trial (<5MW or 1,430 Consumers*)
- [redacted] – Publish Close Down Report

*(based on EirGrid's estimation of 3.5kW per Customer)

3.3 Expected trajectory of capacity of scheme

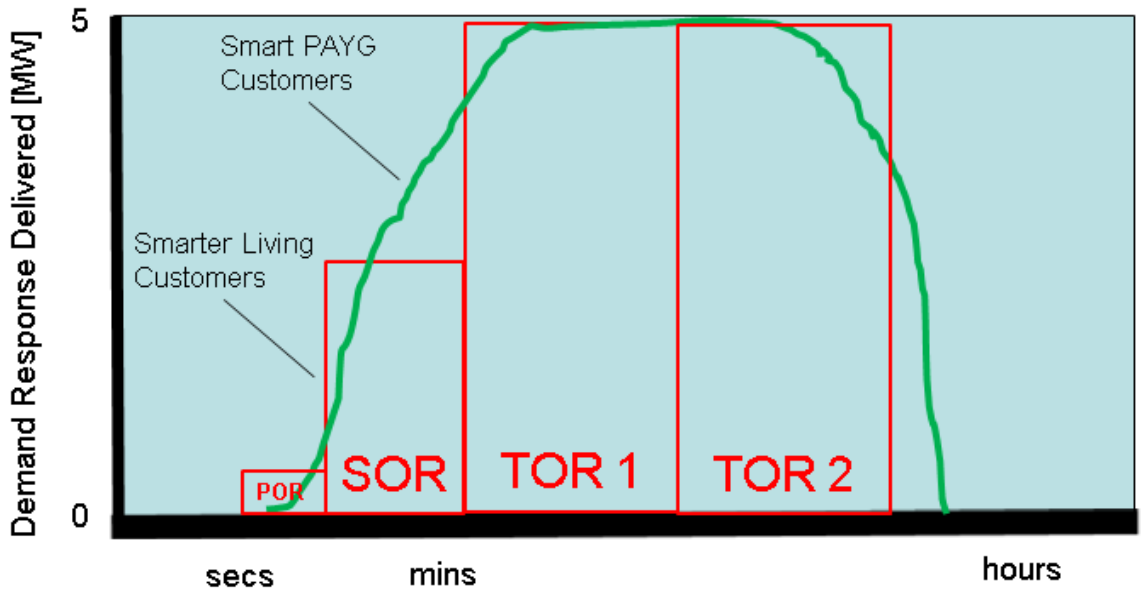
The expected profile of customers participating in the demand response project together with the nominal demand response capacity is shown below.

FIGURE 1: ELECTRIC IRELAND DEMAND RESPOND CUSTOMERS



An illustration of the time profile of demand response delivery is shown in Figure 2 with the likely DS3 (Delivery of Secure Sustainable Electricity System) System Services Products superimposed. The actual profile of delivery will be developed and refined through performance monitoring and behavioural analysis over the course of the project.

FIGURE 2: ILLUSTRATIVE PROFILE OF DEMAND RESPONSE DELIVERY & SYSTEM SERVICES PRODUCTS CHARACTERISATION



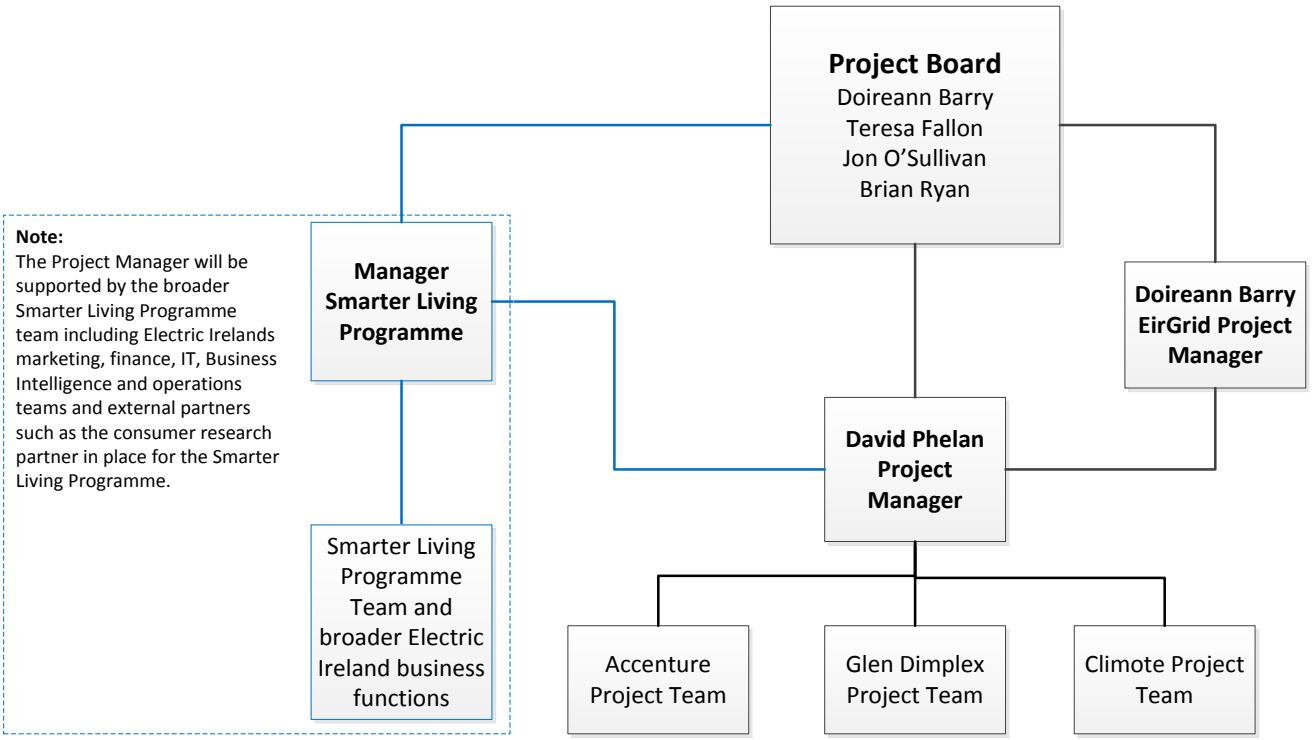
It is likely that Smarter Living customers who are able to control appliances remotely could respond within minutes (or even seconds) while Smart PAYG customers may take a little longer. Naturally, there will be a spread in response times from different customers and these response times will likely vary depending on when in the day (or night) the demand response is called. The take-up from Smart PAYG customers on any particular event may vary depending on whether they are at home or not at the time. Consequently, the behavioural analysis will be important in establishing the likely level and profile of demand response available.

4. Contingency Plans

The key risks for the scheme are identified in section 2.9 of this document, which also describes the contingencies in place to reduce the risks. There are a number of different phases and work streams being delivered in order to deliver the overall solution. Aside from the individual contingency plans in place for each individual risk, the approach will be to proactively assess the risks, communicating any changes in the likelihood of these risks becoming a reality to the project board and at all times have a contingency plan for the individual risk in place. Contingency plans may range from re-ordering the timing of different tasks or phases to implementing different technologies or solutions.

5. Project Organisation Structure

5.1 Project Organisation Structure



5.2 Project Roles & Responsibilities

5.2.1 Project Board Members

Electric Ireland Project Executive	Brian Ryan
EirGrid Project Executive	Jon O'Sullivan
Senior Supplier, Electric Ireland	Teresa Fallon
Senior User, EirGrid	Doireann Barry

5.2.2 Project Manager Role

The Project Manager has the authority to run the Project on a day – to day basis of behalf of the Project Board within the constraints laid down by them. The Project Managers prime responsibility is to ensure that the project produces the required products within the specified tolerances time, cost, quality, scope, risk and benefits. The Project Manager is also responsible for the project producing a result capable of achieving the benefits defined in the Business Case. During the development phase the Project Manager

is required to take the outline Business Case and develop it into an approved Business Case. This involves completing all necessary procurement, including selecting the technology; developing the financial model and the required commercial solution.
The Project Manager identifies the appropriate membership and structure of the Project Team which works with the Project Management Team to successfully deliver the requirements, design, build, test and deploy phases and is approved by the Project Executive.

The role of the Project Manager includes the following responsibilities.

- Ensure compliance with the change management process including signoff at the appropriate level as detailed in the project governance and control framework
- Ensure the Business Case and all submissions required for approval are prepared, reviewed and validated
- Ensure Business Case realisation reviews are completed. (ongoing analysis, reporting, planning and mitigation)
- Preparation of project board papers and submissions
- Project progress and status reporting including ongoing risk management, Business Case review and resource requirements
- 'Own' and manage the development and execution of the Project Charter and the Project Master Plan and request approval from the Project Board
- Ensure all Project Management documentation is generated, reviewed and uploaded to the Project SharePoint site
- Regularly review all Project Management documentation on the Project SharePoint site to ensure the documentation is current, up to date and relevant
- Capture and share on-going lessons learned and knowledge sharing in conjunction with the Project Management Team and the PMO
- Part of the ITS and other project approval spend ensuring alignment to budget and strategy
- Develop and implement a Stakeholder Management Plan for the project

Project Management Team responsibilities include:

- Individually manage all assigned deliverables, work packages and teams
- Input into and review the Project Master Plan and associated project documentation in accordance with PMO standards
- Planning and designing the work package
- Proactively monitoring, Reporting on progress, Resolving issues and initiating corrective action as appropriate
- Managing the costs associated with that work package
- Managing the dependencies and interfaces between work packages
- Plan and implement in conjunction with the Project Manager
- To Review, Assess, Facilitate resource assignment and utilisation for the project
- Assess and review relevant risks relating to the project
- Deliver the project according to the approved methodology

Project Support Office Lead (PMO):

The Project Support Office Lead will be responsible for developing and co-ordinating the governance and control processes for the Residential Digital Portal Project. It will also be responsible for providing a central administration and facilities management function.
Governance and Control will be provided through the following activities:

- Provision of Tools
- Support for Planning
- Reporting Process and supporting templates
- Resource Management
- Change Control
- Configuration Control
- Issues Management

- Risk Management
- Risk Monitoring & Control
- Scheduling
- Planning updating
- Status Reporting Mgmt
- Cost Mgmt Reporting
- Sharepoint Mgmt
- Status Reporting Mgmt by stream

Is responsible for delivering the project successfully, enabling a sustainable business in line with the approved business case.

5.2.3 Other Key Project Roles

Project Executive: is appointed by the Project Sponsor(s) and has ultimate accountability to the Project Sponsor for the successful delivery of the project and the associated business case for the project.

Project Board: is a cross-functional group of senior stakeholders responsible for providing guidance and decision making regarding project direction and changes affecting the project outcome. The Project Board is accountable for the successful delivery of the project and the associated business.

Senior Supplier: The authority to commit Supplier resources and services in order to meet quality, timelines, costs and deliverables as stated in the project objectives.

Senior Users: Represents the voice of the end users with regard establishing the requirements, features, functionality

Additional Team roles

- Project Management Office
- Business Process Analysts (1 BA's – leads) reporting to the Project Manager
  - The Business Analysts will initially identify user requirements for the end to end process and incorporate into the Business Process Document.
  - The Business Analyst will work with the Project Manager, the Third Party Suppliers and the EirGrid Project Team to ensure that the business process documents are at a level and format which provides a detailed understanding of how the process will work, the steps involved and the roles and responsibilities required to deliver the process.
  - The Business Analyst will organise and facilitate detail design workshops To-Be processes will be documented with the business representatives, subject matter experts and technical leads.
  - This includes the creation of the end-to-end view 'TO BE' process diagrams, supporting documentation.
  - The Business Analysts will also gather functional requirements at these workshops and record them in the Requirements Traceability Matrix when BPD sign off has been completed.

5.2.4 Project Assurance

Internal Project assurance will review the project in line with established project governance standards.

5.2.5 Frequency of Meetings

Project Board Meetings will be take place on a monthly basis or more frequently as required by exception in order to make decisions move forward at busy periods in the project.

6. PROJECT COMMUNICATION AND STAKEHOLDERS

6.1 Project Communication Method

The objectives of the communications strategy are:

- To ensure that there is clear and effective communications channels with well defined responsibilities for all internal and external stakeholders.
- To have effective communications with related businesses and projects in order to:
  - minimise duplication of initiatives.
  - maximise the synergies between initiatives
  - ensure that there is a co-ordinated approach to external stakeholders
- To have effective communications within EirGrid to ensure that the Project is operated in a comprehensive and co-ordinated way. These objectives will be achieved using the following:
  - Formal and informal meetings with the key influencers will continue on an ongoing basis
  - Close contact will be maintained with related stakeholders and projects with both regular and ad-hoc meetings as required.
- A weekly project team meeting will continue on an ongoing basis.

6.2 Project Stakeholders

The following is an initial list of project stakeholders. The project will have a Stakeholder Management Plan which will include a list of all the Stakeholders for the project to show how their expectations will be managed. The Project Manager is responsible for delivering the Stakeholder Management Plan.

Electric Ireland Internal Stakeholders

- Director Electric Ireland & BSC
- Electric Ireland SMT
- Electric Ireland Staff
- Electric Ireland Smarter Living Panel and Focus Groups

EirGrid Internal Stakeholders

- EirGrid Director
- EirGrid SMT
- EirGrid Staff

Tier 1 Stakeholders

- CER
- ESB Networks DSO
- DCENR
- SEAI

Tier 2 Stakeholders

- General Public

6.3 Principles of Consumer Engagement Plan

Electric Ireland's Consumer Engagement Proposal builds on the established arrangements for customers participating in the Smarter Living Programme. Consumer Engagement will be performed consistent with the following high level principles:

- Electric Ireland will provide (co-branded subject to definition between both parties) incentives for existing Smarter Living Programme customers to participate in this project in the form of financial rewards for demand response event requests as described in the Expenditure Proposal;
- Electric Ireland will provide (co-branded subject to definition between both parties) information and materials to customers to illustrate the nature of the project and apply a protocol whereby a customer will be requested to undertake demand response actions over a number of events which they are at liberty to either accept or decline. Consequently, no appliance or service will be interrupted without the customer's explicit permission and no alteration to their level of comfort (e.g. through reduction of heating) can occur without their consent.
- The principle that no action will be taken on customer appliances without their permission and the guarantee that the customer can override any action.
- A robust customer support facility through Electric Irelands Call Centre and processes enabling any issues to be addressed promptly.

In relation to meter information (MRPN data), Electric Ireland will request customers sign up to Electric Ireland's Terms & Conditions for the project and in doing so will facilitate meter data verification.

6.4 Data Security

Data Management Overview:

Electric Ireland takes the responsibility for protecting our clients' data seriously. Information security and data protection are key priorities. We collect and maintain considerable volumes of personal information about customers and employees. Such data is entrusted to our care and furthermore is subject to data protection legislation. The relevant legislation in Ireland governing data protection is the Data Protection Acts 1988 and 2003. Electric Ireland will ensure that personal information about customers and staff is collected, used and maintained in conformity with this legislation.

The ESB Group Chief Executive Circular for Compliance with Data Protection Acts (CE-16) sets out the overarching rules for Electric Ireland for the protection of personal data/information about customers. There are a number of important information security and data protection policies are in place to inform and guide on the appropriate usage and security of Electric Ireland information assets.

Third Party Data Processors:

Our third party providers Accenture and Glen Dimplex also have data security practices in place.

- Accenture have implemented an industry leading Client Data Protection (CDP) programme focused on prevention. This is part of Accenture's Information Security programme and is directed by the Chief Information Security Officer (CISO).

- Glen Dimplex are developing their own platform solution and the system will be a fully hosted solution and compliant with Electric Irelands technology and ICT requirements.

Before deployment of any technology, Electric Ireland's IT Security Team (part of ESB Groups IT Security Team) carry out full risk assessments and penetration tests.

In terms of hosting, third party supplies are required provide a service that meets the following criteria:

- Hosting provider should have ISO 27000X certification. ESB Audits or viewing of regular 3rd Party Audits (SSAE 16 standard) are also expected
- Electric Ireland must retain ownership of data
- Microsoft ADFS to be used as standard to achieve SSO
- For commercially sensitive or personal data, should use encryption (at rest & in transit)
- For personal & sensitive data - EEA
- For commercially sensitive or personal data (as defined by Data Protection Act) two factor authentication to be used for any access from outside ESB LAN

Management of Customer Data:

Customer details such as email, MPRN, metered data will be maintained, securely on the relevant system. Data being process by Third Party's must conform to Data Protection legislation and all data relating to end users of the service will remain the property of Electric Ireland and must be handled in accordance with the provisions of the Data Protection Acts 1988-2003 (the "DPA")

For example, the following details are held by Accenture for customer using the Smart Energy Controller:

- MPRN
- Tariff details
- email address
- password for account
- metered energy usage data
- control setting
- budget settings

This data is processed by Accenture and under the terms of the Agreement in place with Accenture all The solution must conform to Data Protection legislation.

All data relating to end users of the service will remain the property of ESB Electric Ireland and must be handled in accordance with the provisions of the Data Protection Acts 1988-2003 (the "DPA").

Sharing of Customer Data with EirGrid:

For operational reports, aggregate, anonymised data will be provided to EirGrid for reports.

In order to provide detailed reports where customer level data is required, customers will be informed when signing up to the scheme of the specific data sets that will be shared with the system operator (EirGrid), the purpose that information will be used for, and length of time the data will be retained. It is envisaged that data will not be retained beyond 12 months after the end of the scheme. These details will be finalised in the terms and conditions between EirGrid and Electric Ireland prior to recruiting the customers.

6.5 Independent Verification by EirGrid

Electric Ireland will agree to install EirGrid sourced remote power data collectors to be used in a small selection of homes (up to 10 maximum). This needs to be with the agreement of the customer and Electric Ireland must have right to approve the technology and use their installation contractor to carry out the installation of this equipment.

7. PROJECT CONTROLS

7.1 Risk Management & Review Schedule

The project will adhere to the EI Risk & Issue Management Procedures. Reference PMO Site

An initial risk assessment will be carried out by the project. Mitigating steps will be identified and ownership of each risk will be assigned.

A risk log will be maintained on the project SharePoint site and all project staff have access to this risk log. Risks will be reviewed weekly by the project manager and the project team. Risks that can be addressed at project level will be monitored at these meetings.

The project manager will highlight the highest rated risks along with any other risks that need to be dealt with at the project board. He will also report on the overall risk rating of the project and its trend.

7.2 Quality Management & Review Schedule

This Project will comply with the PRINCE2 Quality theme. Quality Assurance for the Project will be completed independently and externally to the Project as required. A quality review is conducted every two months by the PMO Lead. Reference PMO Site

7.3 Issue Management & Review Schedule

The project will adhere to the EI Risk & Issue Management Procedure. Issue Log & Reference PMO Site

An Issue log will be created and all project staff and key stakeholders will have access to the issue log for logging, reviewing and tracking project issues.

Issues will be evaluated weekly by the project team. Evaluation of issues will assign a priority to each issue and assess impact.

An evaluation of issues will also be done at Project Board meetings on a monthly basis. The project manager will highlight to the project board high priority and high impact issues and any issues that have been either escalated to project board level.