



Orchestration of Renewable Integrated Generation in Neighbourhoods

Grant Agreement Number: 314742

D1.1 Audit Template

WP1 –Community Audit and Engagement

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1. Summary of Evidence

One of the deliverables of Work Package 1 (Community Engagement and Audit) of the ORIGIN project was to complete deliverable D1.1- Audit Template by month 2 (December 2012). This has been achieved.

The development of Building Energy Audit templates is a well-researched pathway from which an International Standard emerged in 2012 -BSEN 16247-1 – European Standard on Energy audits – general requirements. Substantial work has also been conducted in the UK to develop auditing approaches specifically for existing residential buildings. This has created the DomEARM auditing approach. The ORIGIN team has developed an audit template in the last 3 months (Nov 12 to Jan 13) based on these two initiatives.

The template consists of 3 forms. The first form ‘ORIGIN Pre Survey Data Form’ (see page 2) refers to the preliminary documentation that would be requested from individual dwellings prior to a physical audit taking place. This provides some limited demographic information coupled with more detailed information on appliance ownership and energy systems contained in their homes. The second form ‘ORIGIN Building Energy Audit Form’ (see page 10) – gives an example of more detailed information to be collected during the physical audit. The third form –‘ORIGIN Specification Form’ (see page 12) – guides the overall specification of the systems that will be deployed in the buildings to manage the orchestration process.

The information from the three forms can then be collated into a master spreadsheet for the community. This audit approach is being adopted at Findhorn, Damanhur and Tamera and gives extensive information on the buildings from an energy perspective. It is planned that part or all of this approach could be used as a specification for the auditing process required for installing the ORIGIN system in an arbitrary community.

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2. ORIGIN Pre Survey Data Form

Information on Project

Describe Project – For Example

'The ORIGIN project's mission is to develop a sophisticated intelligent ICT system for the management of energy in a community, and associated business models.

The purpose of the proposed solutions is to orchestrate efficient and balanced use of locally generated energy from renewable sources, such as wind or solar energy. User-friendly tools will be developed that provide demand and supply forecasting and propose energy habits. A simple example of this would be to propose the scheduling of energy demanding tasks, such as operating a washing machine, in periods of expected peak supply in accordance with weather forecasting, in the case of wind or solar energy.

The project is a collaboration of eight organisations from five different European Union member states. The developed solutions will be validated in three eco-communities in three different climatic setting in northern Scotland, southern Portugal and the Italian alpine foothills.

You have kindly allowed the project to use your building/dwelling to pilot the system that will be developed by the Research Group. For this we thank you greatly for without your involvement the project would not be able to proceed.

To develop the system, we need to know information about energy consumption and occupancy in your home. This will allow the research group to develop the system that will in turn provide you with information about the timing of your energy consumption that will enable more of the energy generated by the renewable systems to be used locally.

The information will only be viewed by the researchers involved in the project

We would be grateful if you could collaborate by filling in as comprehensively as possible the information contained in the forms provided below. Thank you once again for taking part in this research project.

If you require further clarification of information regarding this audit please contact: _____'

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Property Identification

Property Address	

Data Availability Sheet

Availability of data*				
Previous Energy Survey Data	Dimensioned Drawing Set	Permeability Test	Thermographic Assessment	Historic Billing Information
*Please provide this information in addition to the survey				

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Building and Occupancy Details

Building Type	Apartment		Detached 1 storey		Semi-detached 1 storey	
	Mid-terrace		End-terrace		Semi-detached	
	detached					
Year of Construction	Pre 1900		1900-1940		1940-1960	
	1960-1970		1970-1980		1980-1990	
	1990-2000		2000-2010		Post 2010	
Construction Type	Timber Frame		Cavity Masonry		Solid Wall	
	Other (please specify)					
Ownership Type	Owner occupied		Shared Ownership		Rented	
Glazing Type	Single Glazed		Double Glazed		Triple Glazed	
Internal Floor Area						

Number of Occupants						
Occupant 1	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 2	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 3	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 4	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 5	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 6	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 7	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	
Occupant 8	Type of Occupancy	Retired		Working Adults	Stay at home carer with children	Single occupancy
	Home working	Never		Occasionally	Most of the time	

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Energy Service Details

Primary Space Heating System	Gas Boiler		Oil Boiler		Electric Heating	
	Air Source Heat Pump		Ground Source Heat Pump		Wood Stove	
	Wood Pellet Boiler		Biomass District Heating			
	Other (please specify)					
Second Space Heating System	Gas Boiler		Oil Boiler		Electric Heating	
	Air Source Heat Pump		Ground Source Heat Pump		Wood Stove	
	Gas Open Fire		Wood Open Fire		Coal Open Fire	
	Other (please specify)					
Domestic Hot Water	From main heating system		Gas Boiler		Electric heater	
	Solar Thermal		Electric Shower			
Thermal Stores	Store connected to which system				Store size	
	Store connected to which system				Store size	
	Store connected to which system				Store size	
Solar PV	PV Size (kWp)		Orientation			
	Shading	None		Some		Lots

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Appliances and Electrical Equipment List

Item	Number	Additional Information
Ventilation		
Extractor fans		
Other ventilation system		
Hot water		
Electric shower		
Electric water immersion		
Lighting		
Lamps		
Fixed lighting outlets		
Security Lighting		
Laundry/Clothing		
Washing Machine		
Tumble dryer		
Combined washer/dryer		
Iron		

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Food and Drink		
Fridge		
Fridge freezer		
Freezer		
Dishwasher		
Kettle		
Microwave		
Oven		
Hob		
Toaster		
Food processor		
IT Equipment & Entertainment		
Desktop PC		
Laptop/tablet		
Broadband		
Printer		
Digibox		
DVD player		
Games console (Xbox,		

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Playstation etc)		
TV's		
CD Player		
Projector		
Miscellaneous items		
Clock radio		
Hairdryer		
Hair straighteners		
Landline phone		
Mobile phones		
Smoke Alarms		
Vacuum cleaner		
Burglar alarm		
Electric lawnmower		
Other (Please specify)		

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3. ORIGIN Building Energy Audit Form

Aim of the Audit

The aim of the building energy audit is

- a) Provide a physical representation of the participating buildings – drawings and information
- b) Provide outline information regarding occupancy – who is in the building and when
- c) Provide a description of the energy supply systems connected to the building
- d) Provide a description of the appliances used in the building
- e) Provide a description of the current metering technology connected to the building
- f) Provide a description of any existing controls (e.g. Building Energy Management Systems – BEMS)

By assimilating this information we will be able to make an assessment of:

- a) Baseline building energy consumption
- b) The loads that can potentially be delayed or dispatched
- c) The technology required to monitor systems and appliances
- d) The number of monitoring points that will be required in each dwelling

Participating Buildings

List to be agreed with community

Site Visit Details

It is anticipated that an audit team will spend approximately 1 hour in each defined zone of a participating building .There will be limited requirement for occupant interaction with the audit team – principally to act as a guide to the building zone

For buildings with multiple zones) it would be very useful to speak to the person(s) responsible for maintaining the facility during the Audit.

The Audit team will seek to visit Plant rooms in each building. These will contain Boilers, Air conditioning systems, Air handling systems, Sub-metering equipment, Electricity metering equipment and may require special access to be provided. Please advise if any specific paper work or instruction is required to allow access to these areas.

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Information Required

Information	Additional Description	
Building construction details	Age of construction	
	Number of storeys	
	Photographs of each elevation	
	Type of construction (e.g. concrete frame, timber frame, masonry cavity etc)	
	Wall U value of insulation level	
	Glazing type (e.g. single, double, triple)	
	Lowest floor U value or insulation level	
	Photographs	
General Building Data	Building layout plan	
	Presence of a Building Energy Management System (BEMS)	
	Indication of supplied building services	
	Presence of any existing energy audit or certification information	
	Technical building system schematics indicating system zoning	
	Control diagrams and settings	
Building/energy data for each zone	Floor area	
	Building volume	
	Energy Carriers – present and available <ul style="list-style-type: none"> Description of space heating energy system(s) to include generator (e.g. gas fired boiler), distribution (e.g. hydronic) and emitters (e.g. radiators) Description of space cooling system(s) Description of building or community based electricity generating system(s) 	The description should include types of system (e.g boiler), size of system (kW), make and model, age of system and fuel type used (e.g. gas)
	Energy related data for each energy carrier Energy produced, Energy delivered and energy exported	kWh units for defined periods
	Energy consumption data from any available meters For example Heat meter, Electricity meter, Hot water meter	kWh for defined periods
	Hourly (or other short interval) energy demand – if available	
	Appliance and component data and ratings	
	Activity in the zone	
	Occupancy pattern	

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4. ORIGIN Specification Form

Description			Cloogy													
Name	Nº	Type	SmartPlugs	Hub	Transmitter	Clamp	Prototype Qty					Repeaters	iPoint Tº & H.	iPoint CO2	C-Log 868Mhz	
house	1	A					1	2	3	4	5					
Description			iMeter Solution													
Name	Nº	Type	iMeterRail	iHub Meter	iPoint Tº & H.	iPoint CO2	CT's 50/5	CT's 100/5	RTU NetM.	wall trunking (mt)	Extra Fuse Box					
house	1	A														
Description			Internet Access				SMAAlert		Notes:							
Name	Nº	Type	Internet	Router/Switch	Wi-Fi	Access R.	SMAAlert	SMAAlert								
house	1	A														