ME7

ENERGY STATEMENT

39A PRIORY TERRACE, NW6 4DG

ME7 LTD
Jorand House
Bebington Close
Billericay
Essex, CM12 0DT

ASSESSMENT INFORMATION

Prepared by:
Ondrej Gajdos,
ME7 Ltd

Date:
18 March 2020

DISCLAIMER

The findings, conclusions and recommendations of this report are based on the information supplied. ME7 Ltd disclaims responsibility in respect of incorrect information imparted to them or for the actual performance of any of the building services installations.
This Report is prepared for the use of the newly constructed unit at 39a Priory Terrace; a duty of care is not owed to other parties.

CONTENT

EXECUTIVE SUMMARY

39A PRIORY TERRACE, NW6 4DG

ABOUT THE ENERGY STATEMENT

ME7 Ltd have been appointed to provide an Energy Statement for the proposed development.

This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

Baseline and all estimated energy consumptions have been calculated using full SAP 2012 assessment of the development in accordance with Part L procedures and SAP 10 emission factors in line with the latest GLA planning guidance.

The tables below show a summary of energy requirements for baseline scheme and reduction proposed to be achieved by passive measures, efficient services and on-site renewable energy sources.

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for domestic buildings

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	2.680	0.936
After energy demand reduction	2.615	0.936
After heat network / CHP	2.615	0.936
After renewable energy	2.615	0.936

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for domestic buildings

	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Savings from energy demand reduction	0.065	2%
Savings from heat network / CHP	0.000	0%
Savings from renewable energy	0.000	0%
Cumulative on site savings	**0.065**	**2%**

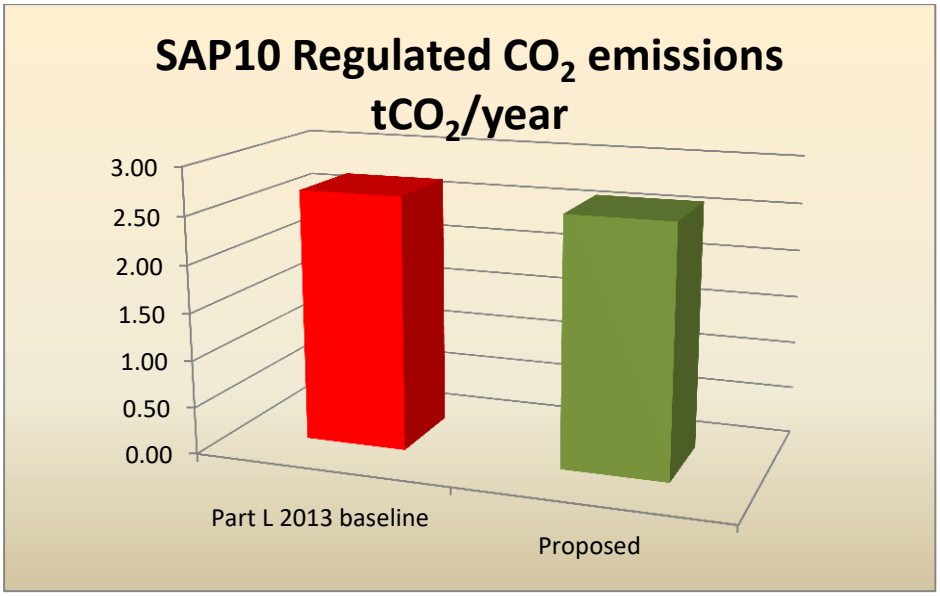


Table 3: SAP calculation specification for each stage of the energy hierarchy - Refurbishment

Specification	Notional Baseline	Proposed Development
External Wall and basement wall U-value	0.18	0.16
Ground floor and basement floor	0.13	0.12
Roof U-value	0.13	0.13
Windows and rooflights U-value	1.50	1.30
Thermal bridging	Accredited construction details throughout	Accredited construction details throughout
Air Permeability	5	4
Space Heating System	Condensing combi boiler, SEDBUK 2009 efficiency 88%, underfloor heating, programmer and at least 2 room thermostats	Gas condensing boiler Vaillant ecoFIT pure 630 or equivalent approved by SAP assessor, radiators, time and temperature zone control, Vaillant weather compensator
DHW System	Condensing combi boiler in each unit, SEDBUK 2009 efficiency 88%,	Indirect DHW cylinder 300L Megaflo Eco or equivalent approved by SAP assessor
Ventilation System	Natural with intermittent mechanical extracts	Natural with intermittent mechanical extracts
Energy Efficient Lighting	75%	100%
% Improvement in CO2 over Building regulations compliant baseline	**0.0%**	**2%**

The proposed house will achieve 2% reduction in regulated CO2 emissions compared to 2013 Part L1A notional baseline
All CO2 reductions are calculated using SAP10 emission factors

Energy consumption of the proposed house

DOMESTIC ENERGY CONSUMPTION AND CO_2 ANALYSIS																
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m^2)	REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - 'BE GREEN' SAP DER WORKSHEET							REGULATED CO2 EMISSIONS PER UNIT							
		Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water	Electricity generated by renewable (-)	Lighting	Auxiliary	Space Heating	Domestic Hot Water	Electricity generated by renewable	Lighting	Auxiliary	SAP10 CO2 emissions (kgCO2 p.a.)	Calculated DER SAP10 (kgCO2 / m2)
39a Priory Terrace	*149.5*	*9203.22*	*Natural Gas*	*2604.84*	*Natural Gas*	*0*	*503.78*	*75*	1,933	547	0	117	17	2,615	17.5

INTRODUCTION

39A PRIORY TERRACE, NW6 4DG

BACKGROUND

ME7 Ltd have been appointed to provide an Energy Statement for the proposed development.
This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

DESCRIPTION OF THE DEVELOPMENT

Construction of a new detached 3-bedroom house arranged over basement, ground and upper ground floor.

NATIONAL POLICY

DCLG sets out basis for local policies in section 14 of National Planning Policy Framework. It requires new development to be planned in ways that can help to reduce greenhouse gas emissions, such as through its location, orientation and design. To help increase the use and supply of renewable and low carbon energy and heat, plans are encouraged to:
a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

BUILDING REGULATIONS 2013 PART L1A

Part L1A sets out 3 main criteria for energy efficiency in newly constructed dwellings:

- CO2 emissions from the proposed dwellings, i.e. Dwelling Emission Rate (DER) has to be lower than the Target Emission Rate (TER)
- Dwelling Fabric Energy Efficiency has to be lower than the Target Fabric Energy Efficiency
- Risk of overheating has to be assessed using SAP appendix P

THE LONDON PLAN

The London Plan is the name given to the Mayor's spatial development strategy. The current version of London Plan was published in 2011 with Further Alterations to the London Plan published in March 2015. The aim is to develop London as an exemplary sustainable world city, based on three interwoven themes.

- Strong, diverse long term economic growth
- Social inclusivity to give all Londoners the opportunity to share in London's future success
- Fundamental improvements in London's environment and use of resources.

Specific requirements on development sustainability are set out in the following policies:

POLICY 5.2 MINIMISING CO2 EMISSIONS

Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

POLICY 5.6 – DECENTRALISED ENERGY IN DEVELOPMENT PROPOSALS

Development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites. Major development proposals should select energy systems in accordance with the following hierarchy:

1. Connection to existing heating or cooling networks
2. Site wide CHP network
3. Communal heating and cooling

Potential opportunities to meet the first priority in this hierarchy are outlined in the London Heat Map tool. Where future network opportunities are identified, proposals should be designed to connect to these networks.

POLICY 5.7 – RENEWABLE ENERGY

The Mayor seeks to increase the proportion of energy generated from renewable sources, and expects that the projections for installed renewable energy capacity outlined in the Climate Change Mitigation and Energy Strategy and in supplementary planning guidance will be achieved in London. Within the framework of the energy hierarchy (see Policy 5.2), major development proposals should provide a reduction in expected carbon dioxide emissions through the use of on-site renewable energy generation, where feasible. There is a presumption that all major development proposals

will seek to reduce carbon dioxide emissions by at least 20 per cent through the use of on-site renewable energy generation wherever feasible.

POLICY 5.9 – OVERHEATING AND COOLING

Major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy:

1. minimise internal heat generation through energy efficient design
2. reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls
3. manage the heat within the building through exposed internal thermal mass and high ceilings
4. passive ventilation
5. mechanical ventilation
6. active cooling systems (ensuring they are the lowest carbon options)

ZERO CARBON POLICY

As outlined in the Housing SPG, from 1 October 2016 the Mayor applies a zero carbon standard to new residential development. The Housing SPG defines 'Zero carbon' homes as homes forming part of major development applications where the residential element of the application achieves at least a 35 per cent reduction in regulated carbon dioxide emissions (beyond Part L 2013) on-site . The remaining regulated carbon dioxide emissions, to 100 per cent, are to be off-set through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere (in line with policy 5.2E). This payment is currently fixed (in most boroughs) at £60/tonne of CO_2 per year for 30 years.

As the proposed development comprises less than 10 newly constructed dwellings, it is not considered a major development in accordance with London Plan definitions. The zero carbon policy, policies 5.2, 5.6 and 5.7 are therefore not applicable.

BASELINE ENERGY CONSUMPTION & CO2 EMISSIONS

39A PRIORY TERRACE, NW6 4DG

Energy assessment using SAP 2012 has been carried out on the actual proposed dwelling using notional baseline specification achieving compliance with 2013 Part L. The specification is set out in Table 3 above.
The notional baseline is based on 2013 Part L1A notional building for calculating Target Emission Rate (TER)

DOMESTIC ENERGY CONSUMPTION AND CO_2 ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m^2)	REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - TER WORKSHEET						REGULATED CO2 EMISSIONS PER UNIT					
		Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary	Space Heating	Domestic Hot Water	Lighting	Auxiliary	SAP10 CO2 emissions (kgCO2 p.a.)	Calculated TER SAP10 (kgCO2 / m2)
39a Priory Terrace	*149.5*	*9404.28*	*Natural Gas*	*2713.75*	*Natural Gas*	*503.78*	*75*	1,975	570	117	17	2,680	17.9

BE LEAN: PASSIVE DESIGN MEASURES AND EFFICIENT SERVICES

39A PRIORY TERRACE, NW6 4DG

Number of passive design measures and measures improving energy efficiency of building services have been included in the design to help to reduce the CO2 emissions, including:

- Newly constructed elements with U-values going beyond the building regs requirement
- High efficiency condensing boiler
- 100% low energy lights

Full specification of the efficient baseline is described in Table 3.

DOMESTIC ENERGY CONSUMPTION AND CO_2 ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m^2)	EGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - 'BE LEAN' SAP DER WORKSHEE						REGULATED CO2 EMISSIONS PER UNIT					
		Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary	Space Heating CO2 emissions (kgCO2 p.a.)	Domestic Hot Water CO2 emissions	Lighting CO2 emissions (kgCO2 p.a.)	Auxiliary CO2 emissions (kgCO2 p.a.)	SAP10 CO2 emissions (kgCO2 p.a.)	Calculated DER SAP10 (kgCO2 / m2)
39a Priory Terrace	*149.5*	*9203.22*	*Natural Gas*	*2604.84*	*Natural Gas*	*503.78*	*75*	1,933	547	117	17	2,615	17.5

OVERHEATING AND COOLING

The house has also been assessed against overheating criteria set out in SAP Appendix P.

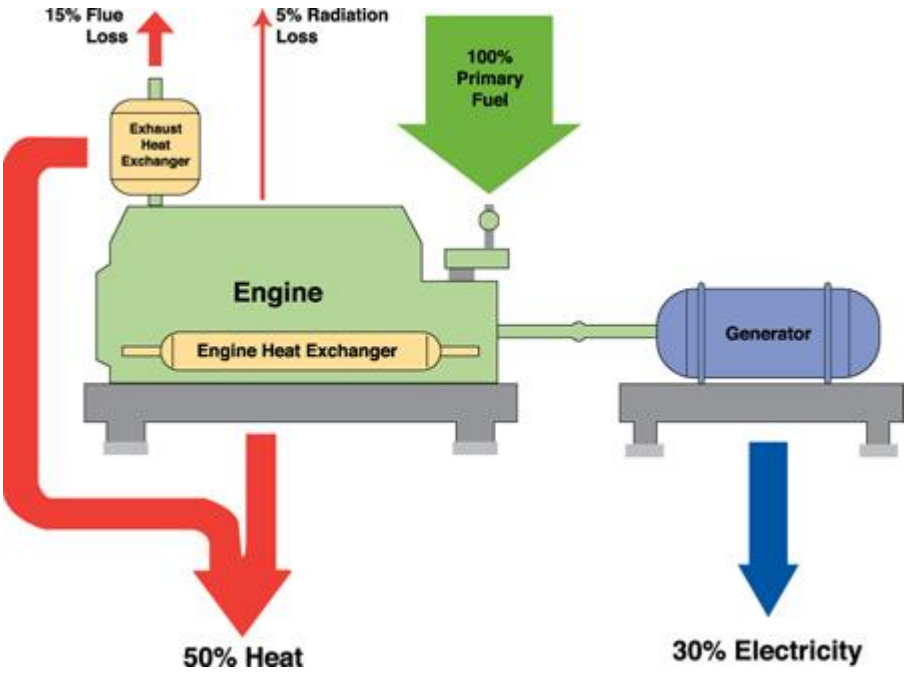
The house complies with the criteria using passive measures - openable windows. Mechanical cooling is not proposed for the development.

BE CLEAN: COMBINED HEAT AND POWER

39A PRIORY TERRACE, NW6 4DG

GENERAL INFORMATION

Although not using any renewable energy source, gas CHP helps to reduce CO2 emissions by delivering heat and electricity locally and reducing the losses that normally occur by conventional power plants. Produced electricity can be exported to grid if the on-site demand is lower than production.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

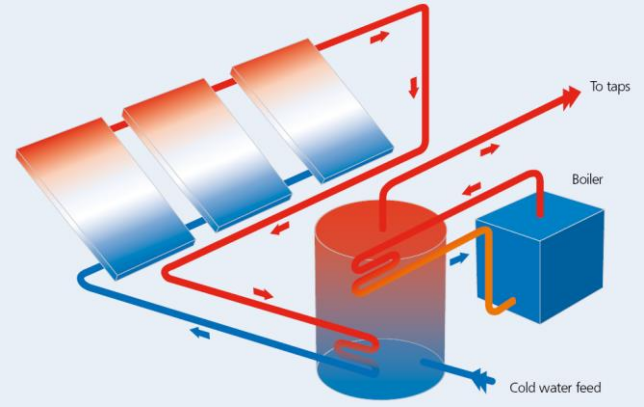
Heat demand of the proposed development is considered too low to make a CHP installation feasible.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - SOLAR HOT WATER (SHW)

39A PRIORY TERRACE, NW6 4DG

GENERAL INFORMATION

Solar hot water systems for dwellings use collector which provides a separate heating circuit for hot water cylinder. This is usually backed up by electric immersion heater or other source of heat.
Two types of collectors are available:
- Flat Plate – less expensive, less efficient
- Evacuated Tube – more expensive and more efficient



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Solar hot water system has been ruled out due to insufficient roof space and heavy overshading from the neighbouring property from the South.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - AIR SOURCE HEAT PUMP (ASHP)

39A PRIORY TERRACE, NW6 4DG

GENERAL INFORMATION

An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can extract heat from the air even when the outside temperature is as low as minus 15° C.

On 17 December 2008, the European Parliament adopted the EU Directive on promoting the use of energy from renewable sources. For the first time however, in addition to geothermal energy, aerothermal and hydrothermal energy are also recognised as renewable energy sources.

There are two main types of ASHP:

AIR-TO-WATER SYSTEM

Air-to-water system uses the heat to warm water. Heat pumps heat water to a lower temperature than a standard boiler system would, so they are more suitable for underfloor heating systems than radiator systems. Although some ASHP systems are capable of heating the water to the higher temperature, the efficiency is higher when using low temperature underfloor heating or low temperature fan convectors.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - AIR SOURCE HEAT PUMP (ASHP)

39A PRIORY TERRACE, NW6 4DG

AIR-TO-AIR SYSTEM

Air-to-air system uses the heat to warm the indoor air. The air is heated through individual fan-coils or centrally and then distributed to rooms via ductwork.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Air source heat pumps have been ruled out due to higher installation and maintenance cost compared to gas boiler, as well as potential problems with noise from the outdoor unit.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - SOLAR PHOTOVOLTAICS (PV)

39A PRIORY TERRACE, NW6 4DG

GENERAL INFORMATION

This system uses semi-conductor cells to convert solar energy into electricity. Two main types of PV panels are available:
- Monocrystalline – More expensive and more efficient
- Polycrystalline – Less expensive and less efficient

Depending on type, the output of 1 kWp (kilowatt peak) can be achieved by panels with area between 5 and 20 m2.

The use of PV panels generally requires relatively large unshaded roof area where they can be mounted facing south, ideally having between 15° and 35° inclination.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Solar photovoltaic system has been ruled out due to insufficient roof space and heavy overshading from the neighbouring property from the South.

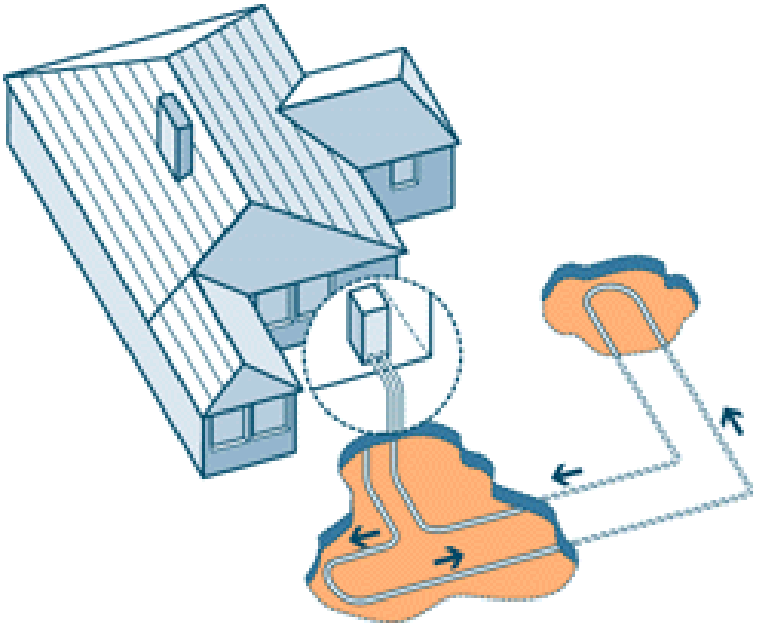
BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - BIOMASS

39A PRIORY TERRACE, NW6 4DG

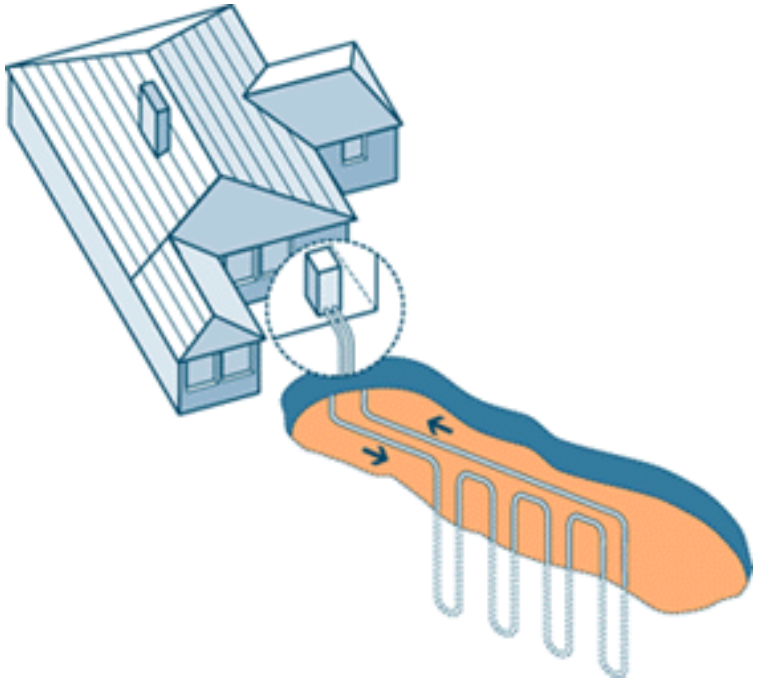
GENERAL INFORMATION

Ground source heat pumps use a buried ground loop which transfers heat from the ground into the building through heating distribution system. GSHP technology can be used both for heating and cooling. Two main types of GSHP are available:

- Horizontal loop is suitable for applications where sufficient area is available to accommodate horizontally buried pipes



- Vertical loop system can be used where ground space is limited, but will require boreholes typically 15-150m deep, and is consequently more expensive to install than horizontal systems.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

GSHP has been ruled out due to high capital cost and insufficient ground space.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - BIOMASS

39A PRIORY TERRACE, NW6 4DG

GENERAL INFORMATION

Producing energy from biomass has both environmental and economic advantages. It is a carbon neutral process as the CO2 released when energy is generated from biomass is balanced by that absorbed during the fuel's production.
There are two main ways of using biomass to heat a domestic property:

- Standalone stoves providing space heating for a room. These can be fuelled by logs or pellets but only pellets are suitable for automatic feed. Generally they are 6-12 kW in output, and some models can be fitted with a back boiler to provide water heating.

- Boilers connected to central heating and hot water systems. These are suitable for pellets, logs or chips, and are generally larger than 15 kW.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Biofuels are ruled out due to negative impact on air quality and environmental issues surrounding liquid biofuels as currently there are no established standards relating to the sustainability of biofuels.