



IRRINOVA DAREK

Irrinova Darek enables the renovation of dwellings to reach the dual aims of saving energy in homes and turning these into cost-effective sustainable units. The renovations can be tailored to the dwelling's specific needs and are flexible such that several energy efficiency measures, integration of renewable energy sources and associated interventions are possible.

Key renovation features:

- Energy performance 20% better than Document F;
- Reduces energy required for heating to Passive house levels;
- Reduces energy required for cooling;
- Reduces the energy required for lighting;
- Enable the integration of renewable energy sources;
- Reduces energy required for domestic hot water

ELIGIBILITY TECHNICAL CRITERIA:

1. Overall Energy Demand

When renovated, the property must achieve an overall energy demand that is 20% improvement over Minimum Energy Performance Requirements - Table 1

- The maximum energy demand is determined as calculated by the Asset Energy Performance Certificate (EPC).
- The property should have a renewable energy contribution. The type of Renewable Energy Source (RES) should be as defined in NZEB definition.



Table 1: Extract from Technical Document F (Part 1, Section 2.1) & Energy Class Requirement of 20% improvement over Minimum Energy Performance Requirements for Irrinova Darek Eligibility

Building Category	Overall Primary Energy Demand for Dwellings kWh/m ² . yr			
	Major Renovations			
	Without RES		With RES	
	Minimum Energy Performance Requirements	Irrinova Darek Criteria (20% Improvement)	Minimum Energy Performance Requirements	Irrinova Darek Criteria (20% Improvement)
Terraced House	70	56	40	32
Fully Detached Villa	70	56	40	32
Fully Detached Bungalow	70	56	40	32
Semi-Detached Villa	60	48	40	32
Ground Floor Maisonette	75	60	75	60
Mid-Floor Flat	60	48	60	48
Top Floor Flat/ Maisonette	80	64	65	52

2. Delivered Energy Demand for Space Heating

The calculated delivered energy demand for space heating should not exceed **15kWh/yr.m²**. The energy demand should be calculated taking into consideration the efficiency of the heating system as 1.

To check if the building satisfies this maximum heating requirement of 15kWh/yr.m², the lighting proportion may be set to 0.8, even if this is actually higher. The .xml file submitted for phase 2 of the scheme shall however show the actual proportion of energy efficient lighting of the proposed building (which should be 0.8 or more as per requirement in Section 5.)



Example shown in Figure 1: Space Heating Delivered Energy (6.87kWhr/yr.m²) is less than 15kWhr/yr.m², when efficiency of heating system is set to 1.

Project Details Overall Dwelling Dimensions Opaque Inputs Glazed Inputs Ventilation Hot water Systems Renewables Results						
Systems	Delivered Energy	Primary Energy	CO ₂ Emissions	Delivered Energy	Primary Energy	CO ₂ Emissions
	[kWh/yr]	[kWh/yr]	[kgCO ₂ /yr]	[kWhr/yr.m ²]	[kWhr/yr.m ²]	[kgCO ₂ /yr.m ²]
Space Heating	680.2	2346.7	597.22	6.87	23.72	6.04
Space Cooling	984.28	3395.76	864.2	9.95	34.32	8.73
Water Heating	1419.17	4896.15	1246.04	14.34	49.49	12.59
Pumps, Fans, etc.	14.6	50.37	12.82	0.15	0.51	0.13
Lighting	353.33	1219	310.23	3.57	12.32	3.14
Renewables and Energy Saving Technologies						
Photovoltaic	0	0	0	0	0	0
Wind Turbine	0	0	0	0	0	0
Second Class Water	0	0	0	0	0	0
Other	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	3451.59	11907.99	3030.5	34.89	120.36	30.63
EPRDM	120.36 [kWhr/yr.m ²]		<input type="button" value="calculate"/>			
DCER	30.63 [kgCO ₂ /yr.m ²]					

Figure 1: Screenshot of EPRDM showing energy less than 15kWhr/yr.m² when efficiency is set to 1.

Project Details Overall Dwelling Dimensions Opaque Inputs Glazed Inputs Ventilation Hot water Systems Renewables Results						
Lighting						
Proportion of Low Energy Lighting Installed	<input type="text" value="0.8"/>					
Energy Required for Lighting	<input type="text" value="353.33"/>					
Space Heating						
Efficiency of Heating System (COP)	<input type="text" value="1"/>					
Enter Manufacturer and Model Name	<input type="text"/>					
Energy Required for Space Heating [kWhr/yr]	<input type="text" value="680.2"/>					
Fuel for Space Heating	Electricity					
Space Cooling						
Efficiency of Cooling System (EER)	<input type="text" value="2.8"/>					
Enter Manufacturer and Model Name	<input type="text"/>					
Energy Required for Space Cooling [kWhr/yr]	<input type="text" value="984.28"/>					
Fuel for Space Cooling	Electricity					
Water Heating						
Efficiency Water Heater	<input type="text" value="1"/>					
Energy Required for Water Heating [kWhr/yr]	<input type="text" value="1419.17"/>					
Fuel for Water Heating	Electricity					
Electricity for Pumps and Fans						
Chilled Water Circ Pump Rated Power	<input type="text"/>	Watts	<input type="text"/>	Is a Timer/Control System Installed?	<input type="text"/>	Is Pump Inverter Controlled?
Heating Water Circ Pump Rated Power	<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
DHW Circulating Pump Rated Power	<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Cooling Water Pumps Rated Power	<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ventilation System Rated Power	<input type="text" value="20"/>		<input type="text" value="20"/>	Yes	<input type="text"/>	<input type="text"/>
Total [kWhr/yr]	<input type="text" value="14.6"/>					
<input type="button" value="calculate"/>						

Figure 2: EPRDM Space Heating Efficiency set to 1

15kWh/yr.m² is the maximum heating demand required to achieve **Passive House levels**. This requirement is intended to ensure that the building is able to conserve energy effectively and independently from the ability to heat and cool the spaces efficiently with an efficient heating or



cooling system and independently from the ability of the building to use Renewable energy sources to reduce the overall energy demand.

3. Delivered Energy Demand for Space Cooling

Maximum calculated energy for space cooling of less than **15kWh/yr.m²** taking into consideration the efficiency of the actual system to be installed. For Air-conditioning systems fitted with inverters, the seasonal efficiency may be quoted.

In the case of buildings where the renovated building is not intended to have a cooling system installed, the efficiency entered in the EPRDM should be the default efficiency for EPCs without a cooling system. i.e. efficiency of 2.8.

This requirement is intended so that the renovated building takes into consideration overheating. The installation of an efficient cooling system will benefit the building in that it requires less energy to cool and may also be used as an efficient heating system. The installation of a system with very high efficiency is being incentivised since the renovated building can achieve the maximum cooling energy demand more efficiently.

4. Minimum Energy Performance Requirements

A building element forming part of the building envelope being replaced or if the building is being extended to a degree which may not be described as a major renovation, the building shall not be required to have a minimum energy performance level. However, each new element forming part of the building envelope shall not be exempt from compliance with maximum thermal conductivity requirements. Refer to Technical Document F - Part 1, Section 2.3(ii).

If the original building undergoing renovation, was constructed following the coming into force of the first Document F (2007), the building, following the renovation under the scheme, shall comply with the respective Document F in force at the time of construction.

The scheme is not intended to fund works within buildings aiming to reach Document F standards already in force at the time of construction.

Clarification 1: Building constructed in 2010 – funds cannot be used to insulate roof since 2007 Document F already requires roof insulation.

Clarification 2: Building constructed prior 2007, having a renovation in 2020 – funds cannot be used to fund wall insulation of the elements renovated in 2020, since 2016 Document F already required wall insulation on these elements.



5. Lighting

Any new lighting installed should be energy efficient as required by minimum energy performance requirements as stipulated in Technical Guidance Document F - Part 2. The renovated building must have a proportion of energy efficient lighting of 0.8 (80%) or more. The proportion of energy-efficient lighting should be calculated on the number of circuits as stipulated in EPRDM methodology.

Existing inefficient lighting should be reduced even if this is not otherwise required by existing Document F or NZEB plan. Efficient lighting is required since lighting provides inefficient indirect heating and could enable buildings to reach heating requirements (2.) in an inefficient way. Since energy-efficient lighting is typically a very cost-efficient way of reducing CO₂ emissions, inefficient lighting should be reduced. 20% is being permitted since, in some cases, halogen lights in recessed fittings within false ceilings may not easily be replaced.

6. Domestic Hot Water

It is not compulsory to install a solar water heater or a heat-pump water heater. This scheme incentivises the installation of such systems since building with SWH an HPWH can achieve NZEB levels more easily. Separately whenever a SWH or a HPWH is installed there is an additional grant of up to €1,000.