Southern Regional Assembly Regional Action Plan

Regional Action Plan to Reduce
Carbon by Monitoring Energy Efficiency
in Social Housing

Tionól Réigiúnach an Deiscirt
Southern Regional Assembly

Ireland's European Structural and Investment Funds Programmes 2014-2020
Co-funded by the Irish Government and the European Union

European Union
European Regional Development Fund


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Glossary of Terms

Acronym	Meaning
3CEA	Three Counties Energy Agency
AGENEAL	Local Energy Management Agency of Almada
ALOEN	The Local Energy Agency of Lorient
BER	Building Energy Rating
CCC	Cork City Council
CSO	Central Statistics Office
EPC	Energy Performance Contracting
ERDF	European Regional Development Fund
EU	European Union
HERB	Holistic Energy-Efficient Retrofitting of Residential Buildings
HVAC	Heating, Ventilation & Air Conditioning
ICT	Information & Communication Technologies
JASPERS	Joint Assistance Support to Projects in European Regions
kWh	Kilowatt-hour
NEEAP	National Energy Efficiency Action Plan
S&E	Southern & Eastern
SEAI	The Sustainable Energy Authority of Ireland
SEROP	Southern & Eastern Regional Operational Programme
SHRS	Social Housing Retrofit Scheme
SRA	Southern Regional Assembly

Part 1: General Information

1.1 General information

Empower – More Carbon Reduction by Dynamically Monitoring Energy Efficiency

Project	EMPOWER – Reduce Carbon Output by Monitoring Energy Efficiency in Buildings
Partner organisation(s) involved	Southern Regional Assembly (SRA)
Description	SRA is the designated Managing Authority for the Southern & Eastern Regional Operational Programme (SEROP). It has responsibility for managing and implementing the SEROP in accordance with EU Regulation. The SEROP is partnered by national, regional and local bodies.

Country	Ireland
NUTS2 region	Southern Region
Contact person	David Kelly
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Table 1.1: General information

1.2 Primary Policy Stakeholder

Name of stakeholder	Cork City Council (CCC), Housing Maintenance, Housing & Community Directorate
Type of stakeholder	Local Authority – Thomas Rogers & Brian Cassidy, Senior Executive Engineers
Description	CCC is the local authority responsible for Cork City, which is located on the south coast of Ireland on Europe's largest natural harbour and is Ireland's second largest city with a population of 210,000. Cork City is a university city with a student population of 35,000 and is a World Health Organisation Healthy City[1]. Cork City is ranked 3rd for small European Cities of the Future and Economic Potential[2] and 1st for Business Friendliness 2018/19 by fDi Intelligence (a service from The Financial Times Ltd) in its 2014-2015 European Cities and Regions Futures Report[3]. Cork City Council provides and maintains the city's parks, roads and housing and is governed by the Local Government Act 2001. CCC have responsibility for the deep retrofit of social housing in Cork City with an objective to improve the quality of the social housing stock, reduce heating costs and our carbon footprint.
Responsibilities/role within the development and implementation of the policy improvement	CCC have obtained grant funding to undertake deep energy retrofits on 129 social housing apartments in Cork City. As part of this process, CCC will also install wireless energy monitoring equipment in 8 units to provide before and after data on the energy savings following the deep retrofit and identify where energy is being used or wasted.
Does this organisation provide political backing to the implementation of the policy improvement? If yes, how?	Yes. The elected members are providing political support at a local level to CCC to improve our policy instrument by agreeing to install energy monitoring equipment in a pilot programme in Cork as part of their deep retrofit of social housing.

Table 1.2: Details of Primary Policy Stakeholder participating in policy improvement design and implementation

1. *http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/who-european-healthy-cities-network/membership/list-of-phase-vi-healthy-cities*

2. *https://www.google.com/search?q=fDi%2520European%2520Cities%2520and%2520Regions%2520of%2520the%2520Future%25202018_19%2520(1).pdf&rlz=1C1GCEA_enIE852IE852&oq=fDi%2520European%2520Cities%2520and%2520Regions%2520of%2520the%2520Future%25202018_19%2520(1).pdf&aqs=chrome..69i57.3158j0j4&sourceid=chrome&ie=UTF-8*

3. *https://www.berlin-partner.de/fileadmin/user_upload/01_chefredaktion/02_pdf/studien-rankings/2014/European-Cities-of-the-Future_2014-15.pdf*

1.3 Stakeholders involved in development & implementation of policy improvement

Name of stakeholder	Department of Housing, Planning & Local Government
Type of stakeholder	Irish Government Department and National policy-making organisation and Intermediary Body.
Description	• Will be involved as key national stakeholders driving the funding of the deep retrofit programme for social housing in Ireland. • They will participate as national public policy representatives and contribute to the interregional exchanges as part of the stakeholder group and will contribute to the Regional Action Plan • They will use the final report of the EMPOWER project to disseminate the findings to relevant bodies to influence future policy changes.

Table 1.3: Details of organisation 2 participating in policy improvement design and implementation

Name of stakeholder	The Sustainable Energy Authority of Ireland (SEAI)
Type of stakeholder	National Funding Beneficiary Body - Alan Ryan Programme Manager & Josephine Maguire Retrofit Programme Manager
Responsibilities / role within the development and implementation of the policy improvement	• They will participate as national public policy representatives and contribute to the interregional exchanges as part of the stakeholder group and will contribute to the Regional Action Plan. • They will use the final report of the EMPOWER project to disseminate the findings to relevant bodies to influence future policy changes.

Table 1.4: Details of organisation 3 participating in policy improvement design and implementation

Name of stakeholder	Three Counties Energy Agency (3CEA)
Type of stakeholder	Three Counties Energy Agency (3CEA)
Responsibilities / role within the development and implementation of the policy improvement	3CEA will undertake a feasibility report on the proposed Energy Efficiency Financial Instrument Model for the Social Housing sector in Ireland.

Table1.5: Details of organisation 4 participating in policy improvement design and implementation

Part 2: Policy Context of Action Plan

1.1 General information

The Action Plan aims to impact:

- Investment for Growth and Jobs Programme
- European Territorial Cooperation Programme
- Other regional development policy instrument

S&E Regional Programme area

Name of the policy instrument(s) addressed: The Southern & Eastern Regional Operational Programme 2014-2020 – Priority 4 (c): "Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector.

Description of the ***Regional Policy Context***

Ireland's 4th National Energy efficiency Action Plan (NEEAP)[4] to 2020 emphasises that improving Ireland's energy efficiency is an essential part of Ireland's energy policy. It set outs the actions required to achieve Ireland's 2020 energy efficiency target, which is to reduce energy demand by 20% across the whole economy and includes a specific 33% energy reduction target for the public sector. Significant progress has been made and following the implementation of the 3rd NEEAP Ireland had reduced energy demand by 12% to the end of 2016.

Data published by the Central Statistics Office (CSO) in 2019[5] on domestic Building Energy Ratings (BER) shows that 78% of pre-1977 dwellings have a BER of D or lower in Ireland, while for houses-built post 2010, the comparable figure is just 1%. This clearly demonstrates that the age of dwellings is the most important determinant of the energy performance of domestic dwellings.

There are currently 130,000 national social housing units in Ireland mainly located in the cities and towns in Ireland. It is estimated that some 25,000 of these units are older properties with low levels of energy performance, due mainly through heat loss through the fabric of the building. Of these 25,000 units, difficulties arise in the case of 2,000 apartments located in apartment complexes (1,500 based in Dublin city and the remainder in Cork & Limerick cities) that do not meet building standards of energy efficiency and require a substantial energy retrofit.

Based on the above analysis Ireland decided to concentrate resources within the Southern and Eastern Regional Operational Programme (SEROP) 2014-2020[6] under Priority 4 (c) to support energy efficiency in the housing sector which will assist in meeting the minimum 20% of European Regional Development Fund (ERDF) resources required to be invested nationally in the low carbon economy and will promote an increase in green jobs in Ireland in line with the Investment for Growth and Jobs Programme. In particular, Ireland will focus on the low carbon retrofitting of social housing to improve their energy efficiency. For further information on how the policy instrument will be improved by our actions please refer to Part 4 of the Regional Action Plan.

4 https://www.dccae.gov.ie/documents/NEEAP%204.pdf
5 https://www.cso.ie/en/releasesandpublications/er/dber/domesticbuildingenergyratingsquarter12019/
6https://www.southernassembly.ie/eu-programmes/southern-and-eastern-regional-operational-programme-2014-2020

Description of the ***Policy Instrument Selected For Improvement***

The SEROP 2014-2020 is a funding package of €500 million, co-funded through the ERDF and the Irish exchequer, to be invested in the region over the programme period. €133 million of this funding package will be invested in Priority 4 supporting the shift towards a low-carbon economy in all sectors in the Southern & Eastern (S&E) region.

We have selected SEROP 2014-2020 – Priority 4 (c): "Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings and in the housing sector" for improvement under the EMPOWER project.

One of the funding schemes under Priority 4 is the Social Housing Retrofit Scheme (SHRS)[7] seek to retrofit 2,000 older social housing units/ apartments (approximately 1,500 units based in Dublin city and the remainder in Cork & Limerick cities) that do not meet building standards of energy efficiency and require a substantial energy retrofit. The principal objective of the SHRS is to meet Ireland's commitments in relation to carbon emissions reductions and energy reduction targets for 2020. Implementation of energy efficiency measures in buildings will make a significant contribution to Ireland's carbon emissions reduction targets and energy reduction targets for 2020. The frameworks within which these measures are being implemented, are provided by the Recast Energy Performance of Buildings Directive[8] and Energy Efficiency Directive[9].

Energy savings in buildings will contribute 45% of Ireland's total energy savings targets for 2020. The energy retrofitting of buildings in the private and public sector hold the greatest potential for energy savings. It is intended that the SHRS will fully meet the stringent requirements and ambitious targets of the Energy Efficiency Directive. The SHRS has two elements – Void Retrofits and Tenanted Retrofits. For the purpose of EMPOWER we will be concentrating on tenanted retrofit.

Secondary objectives of the SHRS include:

- Stimulating employment generation within the construction/energy retrofitting sector. This measure will support some 4,167 jobs, taking account of both direct and indirect jobs, over the implementation period;
- Demonstrating the importance of public sector bodies leading by example as required by the Recast Energy Performance of Buildings Directive and the Energy Efficiency Directive.

7https://www.housing.gov.ie/housing/social-housing/other/improvements-existing-wellings#Energy%20Efficiency%20-%20Retrofitting%20Measure
8 https://www.dccae.gov.ie/en-ie/energy/legislation/Pages/Energy-Performance-of-Buildings-Directive-(EPBD).aspx
9 https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive

€133 million of this funding package will be invested in Priority 4 supporting the shift towards a low-carbon economy

Description of the need(s) ***to be addressed through the policy improvement***

The current SEROP is concerned with the physical work of retrofitting thermally deficient and older social housing units. The current Irish methodology for calculating the energy efficiency of social housing units after deep retrofitting is by calculating the energy rating of the units using BER classification. This however only provides an indication of energy performance.

Through EMPOWER we are seeking to improve the policy instrument by implementing a pilot to calculate the actual energy usage using energy monitoring equipment of some of these social housing units. By introducing energy monitoring of the units retrofitted we will create a mechanism to quantify the exact energy savings before and after the deep retrofit.

On foot of the pilot of energy monitoring equipment as part of the retrofitting of social housing units in Cork an opportunity now exists, in agreement with the Department of Housing, Planning and Local Government, the Intermediary Body for the Social Housing Retrofit Scheme under Priority 4 of the SEROP, to fund energy monitoring equipment costs under the scheme. By funding energy monitoring equipment under the SEROP, this will allow Local Authorities to test the actual energy savings before and after the deep retrofit to ensure real energy efficiency behaviour change of social housing residents has been achieved.

We will also seek to quantify the wider benefits to the residents through a survey that will assess their comfort levels. Finally, the energy savings data will be examined with a view to testing the feasibility of a financial instrument for the future funding of deep retrofitting of social housing in Ireland.

"Improving the quality of our lives should be the ultimate target of public policies. But public policies can only deliver best fruit if they are based on reliable tools to measure the improvement they seek to produce in our lives."

ANGEL G URRÍA, SECRETARY GENERAL OECD

Part 3: Stakeholders Involvement

The original Europe 2020 Strategy Communication of the European Commission underlined the importance of a partnership approach: **"This partnership approach should extend to EU committees, to national parliaments and national, local and regional authorities, to social partners and to stakeholders and civil society so that everyone is involved in delivering on the vision."**

3.1 SRA Stakeholder Engagement for EMPOWER Project

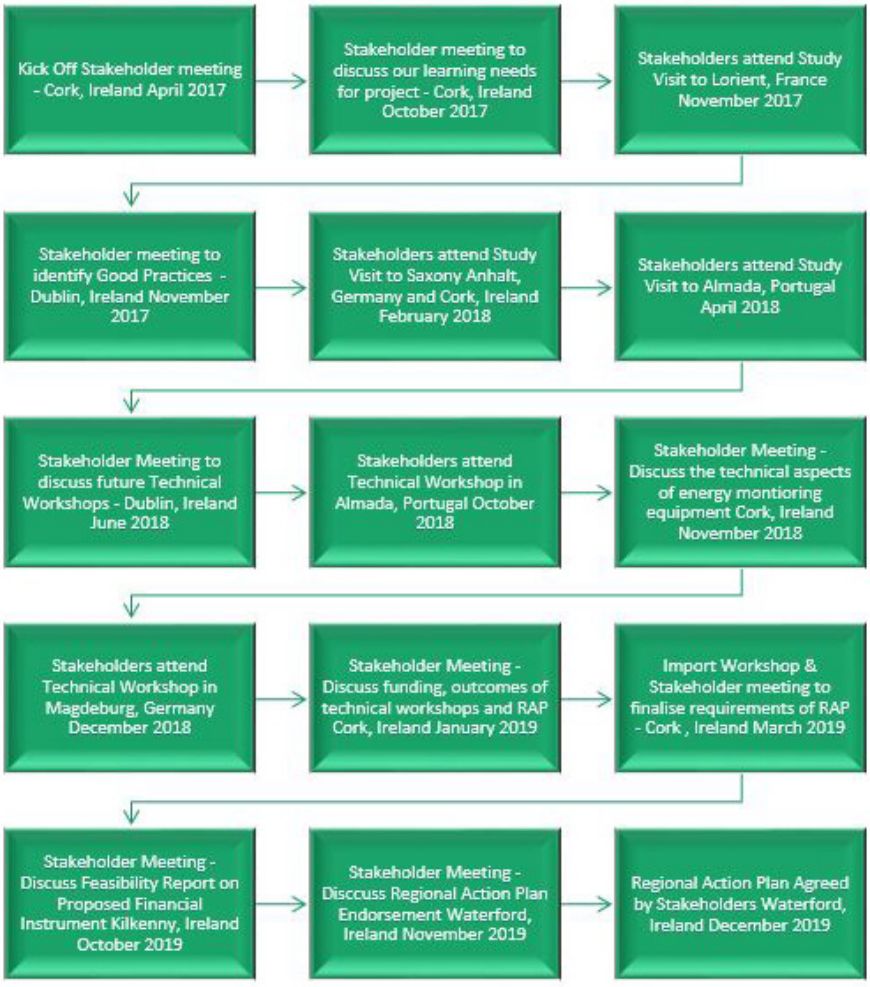


Figure 3.1: SRA Stakeholder Engagement for EMPOWER project

The SRA in keeping with the Europe 2020 Strategy Communication has over the past number of year's utilised extensive and broad ranging consultation and created key stakeholder groups for regional development and European projects. These stakeholders were invited to join the EMPOWER stakeholder groups and included government departments, state agencies, higher education institutes, local authorities, enterprise support organisations, research institutions and public authorities, public participation networks, environmental groups, specialist interest groups and civil society.

"We can only find the right answers to the challenges we face by involving as many stakeholders as possible.....in the process"

EUROPEAN COMMISSION (SCIENCE IN DIALOGUE)

Part 4: Regional Actions & Timeframe

4.1 Regional Actions

Regional Action 1 – Implementation of energy monitoring equipment to calculate exact energy savings of deep retrofitting of social housing units in Cork and investigate the possibility of creating a Financial Instrument, which could assist in funding the cost of deep retrofitting in social housing in Ireland.

Relevance to the Project

Our current policy instrument the SEROP is only concerned with the physical work of retrofitting social housing units, which has been funded by grants to date. Our action is to install energy monitoring equipment in a pilot project to measure the energy savings before and after retrofitting of social housing units in Cork City. This will for the first time, create a mechanism to quantify the exact energy savings before and after the retrofitting of these units and thereby improve our policy instrument by including the costs of energy monitoring equipment for upcoming calls. This will also allow Local Authorities to test the actual energy saving before and after the deep retrofit to ensure real behaviour change of social housing residents has been achieved.

This action was originally inspired by AGENEAL Good Practice 2.1: Pilot Experience in Social Housing: Intelligence Monitoring of Energy Consumption. Good Practices 5.1 "Saint-Sulpice Smart City" and 5.2 "Raspberry Pi Electricity Monitoring and Free Software Data Collection" provided us with knowledge on wireless technology and measures to ensure we protect our data when commissioning the new energy monitoring software and equipment. We then attended two Interregional learning events in Lorient, France and Almada, Portugal to enhance our understanding of these good practices.

Relevance to the Project

At the Technical Workshop "Energy Monitoring, Regulation & Management" in Almada, Portugal, we looked at the social dimension of energy monitoring and behavioural changes. This inspired us to take the opportunity to enrich our data by undertaking a before and after survey of these tenants to identify any wider benefits of our retrofitting programme.

Once we have established the exact energy savings we will investigate if our proposed Financial Instrument could be used to change the model of funding from grant aid to a revolving fund and therefore create a viable financial instrument that would assist with the funding of the retrofitting of social housing in Ireland under our policy instrument.

Our proposed financial instrument model was formulated and inspired in the main by interregional learning from the EMPOWER Technical Workshop for Energy Efficiency Financial Instruments held in Magdeburg, Germany in December 2018. Presentations were provided on financing models including green impact bonds, European Regional Development Fund, European Structural and Investment Funds, Crowdfunding and Energy Performance Contracting.

We then had an open exchange between the expert speakers for a half day to probe more these models. The second day of the technical workshop was dedicated to the joint development with these experts of funding models for financing energy efficiency investment which assisted in formulating and inspiring our financial instrument model which is specific to Ireland's social housing sector.

In particular, an understanding of Energy Performance Contracts (EPC) in the energy efficiency sector was obtained from a presentation from Francisco Puente – Escan Energy Consulting who works with Santander City Council on EPC.

Our involvement with the EMPOWER project led us to commission in November 2017 a Jaspers Technical Assistance Report which provided the basis of understanding the difficulties with monetising energy savings in social housing in Ireland.

Further details on our Interregional learning process are available in Part 5.

Nature of the Action

CCC will install the energy monitoring equipment as part of a pilot project to measure the energy savings before and after retrofitting of social housing units in Cork City. This equipment will provide the data to calculate the energy savings of these units. SRA will then review and monitor the energy monitoring data from the retrofitted units.

In addition, SRA will undertake a before and after survey with these tenants to identify any wider benefits of our retrofitting programme. We will also test the viability of our proposed financial instrument to establish if it is viable and could be used to assist in funding our social housing retrofitting programme. Finally, SRA will then prepare a short report of the results from this pilot project, which will be disseminated, to local authorities in the region and nationally through the Department of Housing, Planning & Local Government, SEAI and The Department of Communications, Climate Action and Environment.

	Main Steps	Deadline	Result
a)	Draft the design of the energy monitoring ICT solution	12/2019	Completed
b)	Test the energy monitoring ICT solution meets the brief which will include environmental in addition to energy measures	01/2019	Completed
c)	Tender for energy monitoring solution to be published	03/2019	Completed
d)	Design a proposed energy monitoring financial instrument for the social housing sector in Ireland	03/2019	Completed
e)	Test tender submissions to ensure energy monitoring ICT solution can be easily integrated into the retrofitting project	06/2019	Completed
f)	Tender for feasibility report on proposed financial instrument to be published	06/2019	Completed
g)	Evaluate tenders for feasibility report on proposed financial instrument and contract with preferred bidder	07/2019	Completed
h)	Evaluate tender submissions and contract with preferred bidder for energy monitoring equipment	09/2019	Completed
i)	Installation of ICT energy monitoring solution in 8 social housing units in Cork City	11/2019	
j)	Feasibility report to be completed and forwarded to SRA	11/2019	
k)	Survey the social housing tenants of these units where the energy monitoring equipment will be installed before the retrofitting to assess their comfort levels	12/2019	
l)	SRA and CCC to review and monitor the energy monitoring data	01/2020 to 06/2021	
m)	Survey the social housing tenants of these units where the energy monitoring equipment has been installed after the retrofitting to assess their comfort levels	06/2021	
n)	Report to be completed on the data before and after the deep retrofitting project by SRA – actual energy savings and results of surveys and findings of financial instrument feasibility report.	08/2021	
o)	On foot of the pilot of energy monitoring equipment as part of the retrofitting of social housing units in Cork an opportunity now exists, in agreement with the Department of Housing, Planning and Local Government, the Intermediary Body for the Social Housing Retrofit Scheme under Priority 4 of the S&EROP, to fund energy monitoring equipment costs under the scheme. This will allow Local Authorities to test the actual energy savings before and after the deep retrofit to ensure real energy efficiency behaviour change of social housing residents has been achieved.	08/2021 – Date of actual policy improvement implemented	
p)	SRA to complete a short report to share the outputs of the EMPOWER project including technology specifications, results from energy monitoring, results from surveys, results of feasibility report on financial instrument with actual energy savings recorded and disseminate to all local authorities in the region and to national bodies	11/2021	

Stakeholders Involved	Cork City Council (CCC), Three Counties Energy Agency and SRA
Timeframe	Installation Deadline: 11/2019 Energy Monitoring Data Collection: 09/2019 to 02/2021 Collation of energy data & survey results: 03/2021 Policy Improvement achieved: 06/2021 Report to be disseminated: 11/2021
Costs	€90,534 & SRA/CCC staff time
Funding Sources	€90,534 Cork City Council and each institution will cover their own staff costs
Performance Indicators	1. Number of properties where energy monitoring was installed. **Target: 8** 2. Establish the reduction in KW/h achieved and % energy savings for the units in the EMPOWER project. **Target 10% energy savings** 3. % Number of surveys completed. **Target: 75% completion rate** 4. Number of entities report disseminated to. T**arget: 10 local authorities and 2 national bodies**

Table 4.1: Action to develop and implement the policy improvement

4.2 Enablers and barriers of Action Plan development and implementation

Enablers		
Enabler title	**Description of enabler**	**Importance of enabler and potential impact on development and implementation of policy improvement**
1	**Cork City Council**	The continued support of CCC is pivotal to the successful data gathering and analysis, which is critical to the development and implementation of our policy improvement.
2	**Department of Housing Planning & Local Government**	The continued financial support to CCC in the delivery of the retrofit scheme and policy oversight for Local Government.
Barriers		
Enabler title	**Description of enabler**	**Importance of enabler and potential impact on development and implementation of policy improvement**
1	**Cork City Council**	The Regional Action Plan and subsequent policy instrument improvement may be compromised if there is a change in CCC priorities or strategic direction.
2	**Department of Housing Planning & Local Government**	The Regional Action Plan and subsequent policy instrument improvement may be compromised if there is a change financial support provided to CCC for the delivery of their retrofit scheme.

Table 4.2: Enablers and barriers affecting the development and implementation of the policy improvement

4.3 Transferability conditions and factors

Transferability factor		
Factor title	**Description of factor**	**Importance of factor and potential impact on regional transferability of policy improvement**
1	**There are no barriers envisaged to the transfer of the improvement in the Policy Instrument to other regions. Once developed it is easily transferred.**	As we believe that there are no barriers then the impact is minimal as the policy improvement is easily transferable to other regions.

Table 4.3: Factors affecting the regional transferability of the policy improvement

4.4 Risks and mitigating actions

Risks and Mitigating Actions			
Title of risk	**Description of risk**	**Level of probability (High, Medium, Low)**	**Description of mitigating action(s)**
Data Risk	ICT Equipment fails to collect data	Medium	CCC and SRA will ensure appointment of qualified and experience contractor for ICT equipment.
Data Risk	Social Housing Tenant Survey not completed	Low	CCC will keep open lines of communications with tenants to ensure smooth retrofit for tenants, which should ensure their support for survey.
Financial Model	Unable to obtain minimum criteria from third parties to model to assess viability of same	High	Independent company experienced in feasibility studies to be contracted to assist with mitigating this risk.

Table 4.4: Potential risks and mitigating actions

5

Part 5: Interregional learning that Influenced Policy Improvement

The good practices, study visits, import workshop and other learning inspired by our participation in the EMPOWER have assisted us in developing this Regional Action Plan. The EMPOWER project facilitated learning at individual, organisational, stakeholder and interregional level.

Good Practice 2-1	
Title of Good Practice	Pilot Experience in Social Housing: Intelligence Monitoring of Energy Consumption
GP owner (region)	Local Energy Agency of Almada (AGENEAL)
Can this GP address the policy need(s) identified in Table 1.3? If yes, how?	Yes. This good practice provided us with insights, which has informed our choice of energy monitoring technology and the parameters to measure. It also informed our decision to choose social housing as our area of concentration.

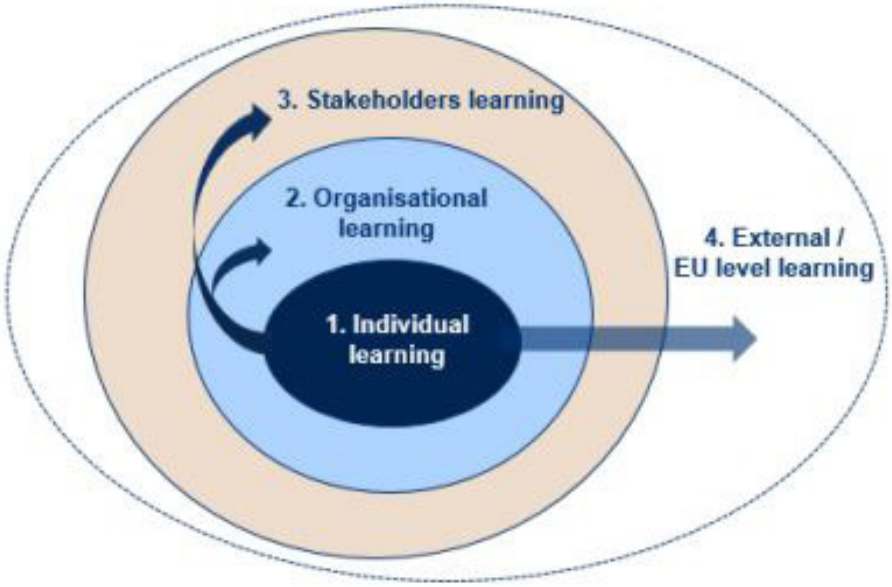
Table 5.1: Description of Good Practice 1 used in policy improvement process

Good Practice 5-1	
Title of Good Practice	Saint-Sulpice Smart City
GP owner (region)	Municipality of Lorient – Municipality of Saint Sulpice La Foret
Can this GP address the policy need(s) identified in Table 1.3? If yes, how?	Yes. This good practice provides ideas on the wireless technology that should be adopted to obtain quality data that can easily be analysed.

Table 5.2: Description of Good Practice 2 used in policy improvement process

Good Practice 5-2	
Title of Good Practice	Raspberry Pi Electricity Monitoring and Free Software Data Collection
GP owner (region)	Municipality of Lorient
Can this GP address the policy need(s) identified in Table 1.3? If yes, how?	Yes. This good practice provided direction to ensure we protect ourselves when commissioning new energy monitoring software and equipment.

Table 5.3: Description of Good Practice 3 used in policy improvement process



Interregional Learning Event	
Type of Event	Study Visit
Location	Lorient, France
When	November 2017
What Learning took Place	This study visit provided more in-depth information and specifications for the Municipality of Lorient's Raspberry Pi Electricity Monitoring and wireless technology. This informed the tendering process when we were commissioning our energy monitoring software and equipment.

Table 5.4: Description of Interregional Learning Event 1 used in policy improvement process

Interregional Learning Event	
Type of Event	Study Visit
Location	Almada, Portugal
When	April 2018
What Learning took Place	This study visit provided us with an understanding of AGENEAL's HERB (Holistic Energy- Efficient Retrofitting of Residential Buildings). This project involved newly retrofitted, multi-apartment buildings used for social housing and involving energy monitoring. This study visit provided further information, which provided us with insights that has informed our choice of energy monitoring technology and the parameters to measure. Because of this study visit, we invited Joao Cleto from AGENEAL to participate in our Import Workshop in March 2019 to further expand on his experience of this project and to share this knowledge with the wider audience who will be assisting with the implementation of the energy monitoring equipment in Cork City and the policy improvements of our SEROP.

Table 5.5: Description of Interregional Learning Event 2 used in policy improvement process

Interregional Learning Event	
Type of Event	Technical Workshop – Energy Monitoring, Regulation & Management
Location	Almada, Portugal
When	October 2018
What Learning took Place	At this technical workshop, there was a presentation on the social dimension of the monitoring and regulation, user involvement, behavioural changes, decision makers and including other policies in relation to green procurement. This presentation assisted us in engagement with our citizens to create buy in for the EMPOWER project and in communicating the overall goals of the project. Following the technical workshop, we invited Ruby Ganchou from The Local Energy Agency of Lorient (ALOEN) to participate in our Import Workshop in Ireland in March 2019 to further expand on her experience in the social dimension of energy monitoring and to share this knowledge with the wider audience involved with the policy improvements for our SEROP. As a direct result of this participation, we have decided to incorporate a pre and post survey of our residents' comfort levels to enhance our understanding of the benefits of retrofitting social housing units.

Table 5.6: Description of Interregional Learning Event 3 used in policy improvement process

Interregional Learning Event	
Type of Event	Technical Workshop for Energy Efficiency Financial Instruments
Location	Magdeburg, Germany
When	December 2018
What Learning took Place	Our financial instrument model was formulated and inspired in the main by interregional learning from the EMPOWER Technical Workshop for Energy Efficiency Financial Instruments held in Magdeburg, Germany in December 2018. Presentations were provided on financing models including green impact bonds, European Regional Development Fund, European Structural and Investment Funds, Crowdfunding and Energy Performance Contracting. We then had an open exchange between the expert speakers for a half day to probe more these models. The second day of the technical workshop was dedicated to the joint development with these experts of funding models for financing energy efficiency investment which assisted in formulating and inspiring our financial instrument model which is specific to Ireland's social housing sector. At this technical workshop, there was a presentation from Francisco Puente – Escan Energy Consulting who works with Santander City Council on Energy Performance Contracting (EPC). As a result, we now have a better understanding on how risk can be reduced by employing EPC within our financial model.

Table 5.7: Description of Interregional Learning Event 4 used in policy improvement process

Other Learning	
Type of Event	Joint Assistance Support to Projects in European Regions (JASPERS) Technical Assistance Report
When	November 2017
What Learning took Place	Our involvement with the EMPOWER project led us to commission in November 2017 a JASPERS Technical Assistance Report which provided the basis of understanding and insights into the difficulties of monetising energy savings in social housing in Ireland.

Table 5.8: Description of Other Learning 1 used in policy improvement process

Other Learning	
Type of Event	The Investment Plan for Europe Financing Energy Efficiency Conference
When	November 2018 – Dublin, Ireland
What Learning took Place	As a direct result of our involvement in the EMPOWER project we have sought opportunities to learn from other sources. This conference was hosted by Hosted by the European Investment Bank, The Strategic Banking Corporation of Ireland and the Sustainable Energy Authority of Ireland and provided an overview of energy efficiency financial instruments available in Ireland, which assisted in informing our choices for our proposed Financial Instrument Model.

Table 5.9: Description of Other Learning 2 used in policy improvement process

Other Learning	
Type of Event	European Commission Webinar – Financing Energy Efficiency in the Industry Sector
When	December 2018
What Learning took Place	Provided information on insurance of energy savings achievements by supplier of retrofit, which we have incorporated into our proposed financial model.

Table 5.10: Description of Other Learning 3 used in policy improvement process

"Power comes not from knowledge kept but from knowledge shared"

BILL GATES, MICROSOFT

Part 6: EMPOWER Project Impact

Cork City Council have been active in the deep retrofitting of social housing units in Cork City for the past number of years. The works undertaken include the insulation of buildings envelop, replacement windows and doors, as well as improvements to HVAC and lighting systems. The cost per unit range from €35,000 to €50,000 per unit retrofitted. The energy efficiency target following the retrofitting is 50% reduction in energy usage (150 kWh/m2a) and an uplift BER from their current level of F-B3 to B2-A3.

The JASPERS report dated 27th April 2018 advised the possibility that due to poor energy efficiency of the social housing stock that many tenants of social housing in Ireland live in fuel poverty and that a significant part of the stock remains under-heated. The JASPERS report suggests that Ireland carry out a monitoring exercise that would aim to assess the real energy and financial savings then energy retrofitting is bringing to the tenants. In addition, the JASPERS report concluded that a financial instrument alone would not be sufficient to mobilise local authorities to undertake energy efficiency investments in social housing.

As part of the EMPOWER project we will now pilot new energy monitoring equipment that will calculate the actual energy savings per kWh before and after the retrofitting of eight pilot units. In addition, we will assess the improvement of comfort levels of the residents of these eight pilot units. Finally, we will test the viability of a potential financial instrument model that may be used to fund future retrofitting of social housing in Ireland.

By undertaking the energy monitoring on this pilot project as part of the EMPOWER project we will have improved our policy instrument by for the first time implementing an accurate calculation of the energy savings of the deep retrofit programme in Ireland.

On foot of the pilot of energy monitoring equipment as part of the retrofitting of social housing units in Cork an opportunity exists, in agreement with the Department of Housing, Planning and Local Government, the Intermediary Body for the Social Housing Retrofit Scheme under Priority 4 of the S&E ROP, to fund energy monitoring equipment costs under the scheme for upcoming calls under the SEROP. This will allow Local Authorities to test the actual energy savings before and after the deep retrofit to ensure real energy efficiency behaviour change of social housing residents has been achieved.

In addition, the findings from the energy monitoring, comfort assessment and financial instrument model feasibility report will be collated into a dissemination report to be forwarded to all local authorities in the Southern Region and to intermediary & beneficiary bodies including SEAI and the Department of Housing, Planning and Local Government. The report will assist in developing the parameters for future funding of deep retrofit programmes in Ireland and will influence future policy instruments.

7

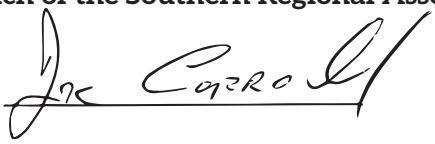
Part 7: Regional Action Plan Endorsements

The Southern Regional Assembly and Cork City Council acknowledge the added value of the EMPOWER project and its contribution to the SEROP and/or other regional mainstream programmes, provided through the identification of Good Practice(s) and Interregional learning and the development of this Regional Action Plan.

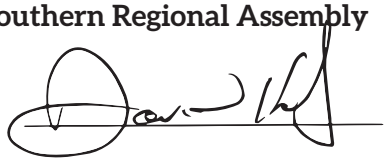
The Southern Regional Assembly and Cork City Council consider the potential import of the Good Practice(s) and Interregional learning mentioned in this Regional Action Plan, with necessary adaption according to regional context, to represent a valuable input for further development of energy efficiency measures and reduction of CO2 emissions in the Southern Region.

We hereby confirm our support for the import and implementation of the Good Practice(s) as described in this Regional Action Plan as well as for the implementation of the action reported in Part 4 of this document.

Name & Organisation: **Councillor Joe Carroll,**
Cathaoirleach of the Southern Regional Assembly

Date: 29/11/2019 **Signature:** 

Name & Function: **Mr David Kelly,**
Director, Southern Regional Assembly

Date: 29/11/2019 **Signature:** 

Name & Function: **Thomas Rogers,**
Senior Engineer, Housing & Community Directorate,
Cork City Council

Date: 02/12/2019 **Signature:** 

Name & Function: **Brian Cassidy, Senior Executive Engineer,**
Housing & Community Directorate, Cork City Council

Date: 2/12/2019 **Signature:** 

Appendix

Appendix 1 – Pre – Retrofitting Home Survey

Comhairle Cathrach Chorcaí
Cork City Council

Empower – More Carbon Reduction by Dynamically Monitoring Energy Efficiency

EMPOWER Interreg Europe

Pre-Retrofitting Home Survey

We would be obliged if you could answer the following survey in advance of the retrofitting of your home. By answering this survey, you will be assisting Cork City Council in ensuring the best outcome from the retrofit of your home. We wish to confirm that all your answers will be kept confidential and can be returned to us in the stamped addressed envelope enclosed. We wish to thank you in advance for your participation in this survey.

Please circle your responses and ratings as follows (use any colour pen): YES/NO

1 (poor quality) 2 3 4 5 (good quality)

1. At present, is the quality of the indoor environment in this home acceptable to you?

   YES/NO

2. At present, how would you rate the quality of Indoor Environment in this home?

   1 (poor quality) 2 3 (neutral) 4 5 (good quality)

3. At present, how would you rate the temperature and warmth of your home?

   1 (very cold) 2 (slightly cold) 3 (neutral) 4 (slightly warm) 5 (very hot)

4. At present, how would you rate the air quality in your home?

   1 (unpleasant) 2 3 (neutral) 4 5 (pleasant)

5. At present, how would you rate the level of condensation on the windows in your home?

   1 (low) 2 3 (moderate) 4 5 (high)

6. At present, how would you rate the level of dampness in your home?

   1 (low) 2 3 (moderate) 4 5 (high)

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European Regional Development Fund

Comhairle Cathrach Chorcaí
Cork City Council

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7. Currently, how would you perceive the external noise inside your home?

1	2	3	4	5
(very noisy)				(very quiet)

9. Currently how cosy and comfortable is your home?

1	2	3	4	5
(very uncomfortable)		(neutral)		(very comfortable)

10. Generally how many hours per day do you have the heating on in your home during colder months of the year?

0	Up to 2 Hours	Up to 4 hours	Up to 6 hours	Over 6 hours
(You do not use heating)				

11. Comments on your home's comfort level are welcomed below:

_____

_____

_____

_____

_____

_____

_____

12. How many people live in your household?

1	2	3	4	5 or above

13. What ages are the people who live in your household? (please put the number in each of the boxes below)

How many under 10 years old	How many between 10 and 20 years old	How many between 21 and 40 years old	How many between 41 and 60 years old	How many above 60 years
☐	☐	☐	☐	☐

14. Are any members of your household currently students studying for exams?

YES/NO

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15. Do any members of your household have underlying medical conditions that would be improved if the comfort levels in your home were improved?

YES/NO

15. If you answered yes above can you please list the type of medical conditions i.e. respiratory, neurological, allergies etc?

_____
_____
_____
_____
_____
_____
_____

16. Are you supportive of the initiative to Deep Retrofit your House?

YES/NO

Thank you very much for your participation in this survey. Please put your completed survey into the stamped addressed envelope attached and return to the address on same.

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Appendix 2: Post- Retrofitting Home Survey

Comhairle Cathrach Chorcaí
Cork City Council

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EMPOWER Interreg Europe

Post-Retrofitting Home Survey

We would be obliged if you could answer the following survey in following the retrofitting of your home. By answering this survey, you will be assisting Cork City Council in ensuring the best outcome from the retrofit of your home. We wish to confirm that all your answers will be kept confidential and can be returned to us in the stamped addressed envelope enclosed. We wish to thank you in advance for your participation in this survey.

Please circle your responses and ratings as follows (use any colour pen): **YES/NO**

1 (poor quality) **2** **3** **4** **5** (good quality)

1. Following the retrofit, is the quality of the indoor environment in this home acceptable to you?

   YES/NO

2. Following the retrofit, how would you rate the quality of Indoor Environment in this home?

   1 (poor quality) **2** **3** (neutral) **4** **5** (good quality)

3. Following the retrofit, how would you rate the temperature and warmth of your home?

   1 (very cold) **2** (slightly cold) **3** (neutral) **4** (slightly warm) **5** (very hot)

4. Following the retrofit, how would you rate the air quality in your home?

   1 (unpleasant) **2** **3** (neutral) **4** **5** (pleasant)

5. Following the retrofit, how would you rate the level of condensation on the windows in your home?

   1 (low) **2** **3** (moderate) **4** **5** (high)

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6. Following the retrofit, how would you rate the level of dampness in your home?

1 (low)	2	3 (moderate)	4	5 (high)

7. How would you perceive the external noise inside your home following the retrofit?

1 (very noisy)	2	3	4	5 (very quiet)

9. How cosy and comfortable is your home following the retrofit?

1 (very uncomfortable)	2	3 (neutral)	4	5 (very comfortable)

10. Generally how many hours per day do you have the heating on in your home during colder months of the year following the retrofit?

0 (You do not use heating)	Up to 2 Hours	Up to 4 hours	Up to 6 hours	Over 6 hours

11. Comments on your home's comfort level following the retrofit are welcomed below:

_____
_____
_____
_____
_____
_____
_____

12. How many people live in your household?

1	2	3	4	5 or above

13. What ages are the people who live in your household? (please put the number in each of the boxes below)

How many under 10 years old	How many between 10 and 20 years old	How many between 21 and 40 years old	How many between 41 and 60 years old	How many above 60 years
☐	☐	☐	☐	☐

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Cork City Council
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14. Are any members of your household currently students studying for exams?

YES/NO

15. Do any members of your household have underlying medical conditions that have been improved, if the comfort levels in your home were improved following the retrofit?

YES/NO

15. If you answered yes above can you please provide detail of the medical conditions improved i.e. respiratory, neurological, allergies etc?

_____
_____
_____
_____
_____
_____
_____

16. Following the Deep Retrofit would you recommend other residents to undergo this process if offered the opportunity by Cork City Council?

YES/NO

Thank you very much for your participation in this survey. Please put your completed survey into the stamped addressed envelope attached and return to the address on same.

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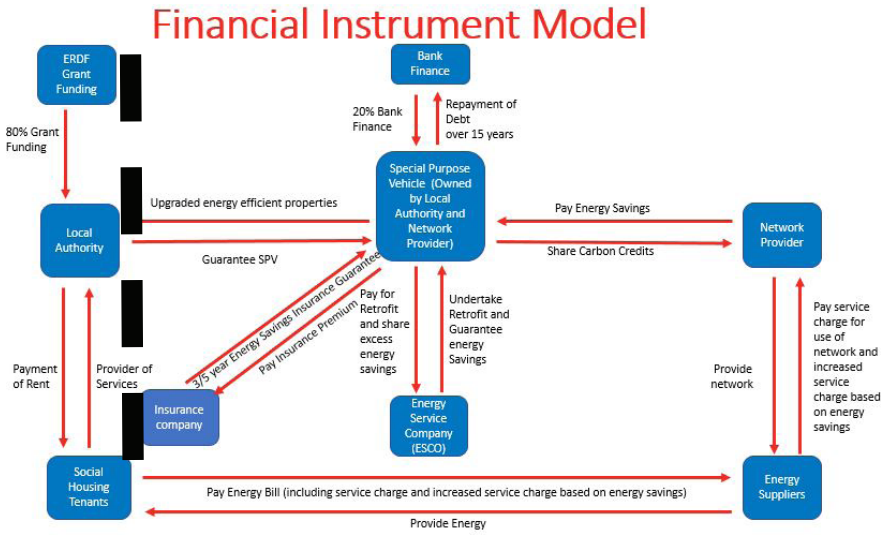
Appendix 3: Extract from Feasibility Report on Financial Instrument Undertaken by Three Counties Energy Agency

Conclusions

From analysing the financial model proposed, in addition to speaking to the various stakeholders involved: it is concluded that the model will not work in its current configuration. The main issue appears to be the numerous stakeholders involved, considering the complex nature of the connections/interactions that exist within the proposed model.

The model presented below has been divided into 2 distinct sections. The "left side" of the process/ model, which includes the EDRF grant funding, Local Authority and tenant appears to function effectively from conversations with the various stakeholders involved. (As this is how numerous financial models currently function). However, as highlighted throughout the report the "right side" of the model/process is extremely complex, with various stakeholders included along the value chain that may not be necessary. This should be simplified by combining the different stakeholders in the existing model.

It is also noted that the scale of funding will never exist from state sources or European to cover the cost of retrofit across the social housing stock at an 80% support rate.



THE SAMPLE FINANCIAL MODEL COMPLETED FOR A SAMPLE OF 10,000 UNITS TO A B2 ENERGY RATING HAS DEMONSTRATED THAT INCLUDING

- Energy Credit Values (Obligated Party Contribution of money)
- Maintenance avoided cost

AND NOT INCLUDING THE

- Carbon tax savings from energy supply
- Energy Savings currently retained by the tenant

That the return on investment incorporating inflation at 2% is negative at -23% when the investigated cost of ESCO work including insurance is required be considered at 8%. Reasoning is that the bank will require to factor in the performance risk/bond from the ESCO. The guarantee provided by the Local Authority is too complex through an SPV between the Local Authority and The Network.

It is noted that on balance sheet lending will require approval from DEPPR (Department of Expenditure and Public Reform) akin to that of the proposed National Street lighting project received in 2019. The cost of guarantees/insurances are unclear as separate models as contracts with installers should in the opinion of the Energy Agency incorporate enough self-quality control and ongoing maintenance penalties for underperforming properties post retrofit. A guarantee of energy savings.

The Irish retrofit housing market has neither the capacity, technically nor the labour capabilities to currently deliver this scale of project in the immediate future. Presently the resources in retrofit struggle to retrofit 12,000 homes per annum nationally to the B2 energy standard. Plastering as a trade is noted to be struggling for apprentices and to complete the deep retrofit required, external insulation solutions are necessary to deliver. A clear line of sight of finance and funding routes to give confidence to the housing retrofit market to

- Tool up
- Skill up
- Deliver quality energy performance guaranteed work

This would then develop instead of annualised grant programmes where no capacity or delivery chain can be planned or delivered over a longer role out period.

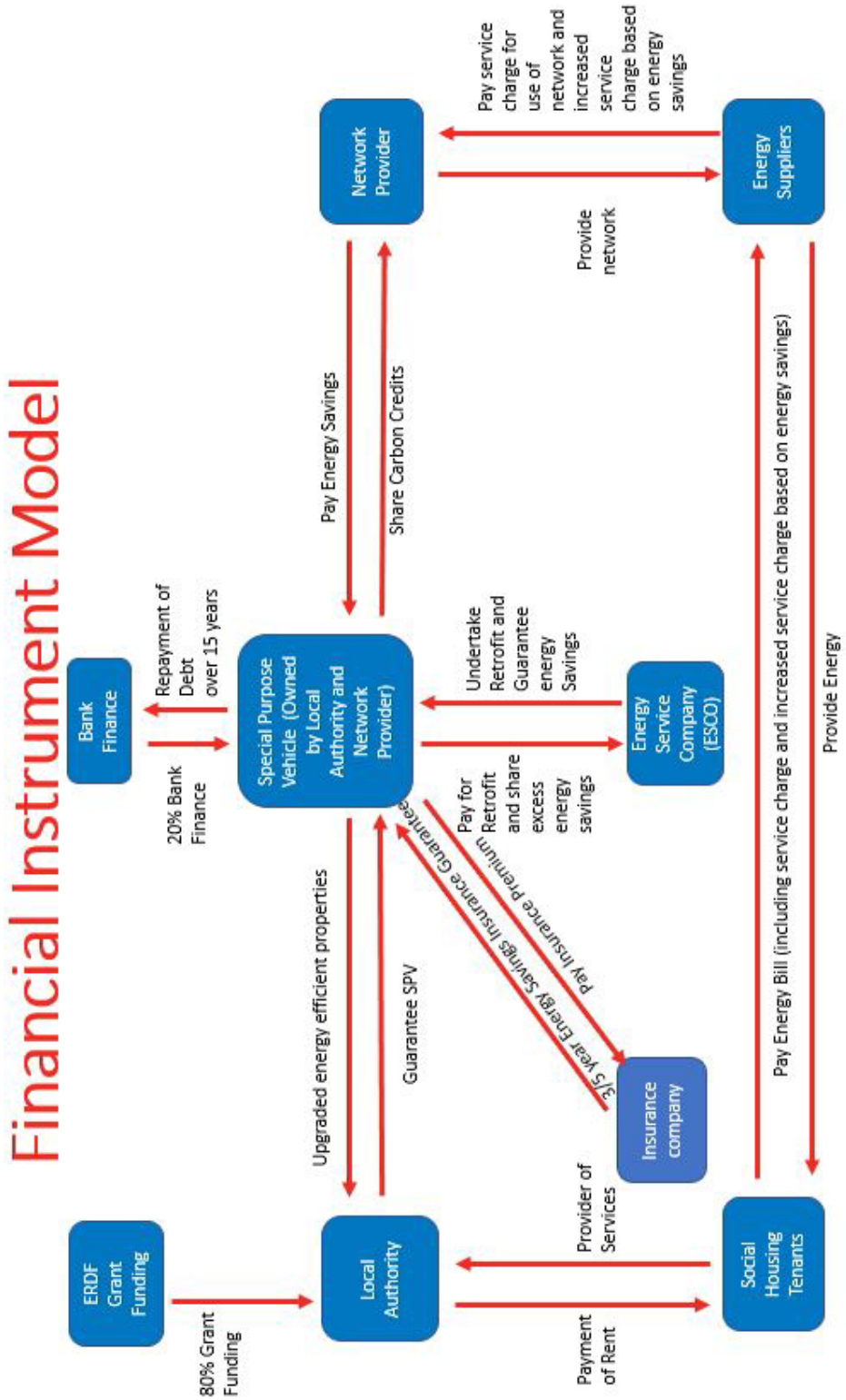
The primary conclusion for the model to be developed will require the market actors to undertake the provision of one stop shop service to retrofit works

- Works
- Finance
- Guaranteed Savings
- Maintenance with penalties provided for non-performance to insure delivery.

This needs to be procured in the market through the EU Platform to attract the scale and capacity with the best practice value for money to deliver at scale. It is evident from our feasibility that the market stakeholders would engage in partnerships, in which they perform their specific skill sets across finance, works, quality and guarantees to which they would bid to participate as a consortium/partnership.

The role of a trusted intermediary is important. A role which is independent of the homeowner, the tenant and the service provider is engaged to oversee the contract delivery and the application of penalties/performance certificates to the model. This is a role that independent energy agencies have been providing across Europe and can do so going forward in this region.

Appendix 4 – Financial Instrument Model for Social Housing Energy Efficiency Retrofitting




Plan
Do
Check
Act
SUCCESS
Cloud
TEAM