DeliveREE
Energising Change

An introduction to

DeliveREE

Joe Hayden, Senior Executive Engineer
Emily Clarke, Energy Engineer

October 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101032833

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Section 01

The Vision

CODEMA TEAM

- **Energy Advisers** to Dublin Local Authorities
- Founded in **1997** as **not-for-profit** organisation
- **32 staff** based in Temple Bar

OUR **SERVICES**

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ENERGY MONITORING & MANAGEMENT

ENERGY AWARENESS

ENERGY POLICY & PLANNING

PROJECT MANAGEMENT

MATCH FUNDING

guarantEE
Building Energy Services in Europe

Interreg
North-West Europe
HeatNet NWE
European Regional Development Fund

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 696040.

EESI 2020 european energy service initiative 2020

- **Facilitators** of Energy Performance Contracts (10 years' experience)
- Providing **Training** of EnPC Project Facilitators

AGENDA

1. **The Vision** - Joe (5 mins)

2. **The Reality** - Emily (10mins)

3. **Project Pipeline progress** - Emily (5 mins)

4. **The Learnings** (the challenges and our solutions) - Joe (10 mins)

DELIVEREE PROJECT

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Overall Project Aim:

1. Create a **Project Implementation Unit** and **scalable delivery model** that can be replicated across Ireland and Europe

2. Deliver **9 signed** Energy Performance Contracts:
    - Value **€20.4m** (**€10.2** from **private finance**)
    - **3.8 ktCO2** and 24GWh **savings**
    - Involving over **140** Local Authority Buildings

PROJECT IMPLEMENTATION **EXPERIENCE**

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guarantEE
Building Energy Services in Europe

Interreg
North-West Europe
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EESI 2020 european energy service initiative 2020

- **4 x Energy Performance Contracts**
  - ✓ **15** public buildings
  - ✓ **€3,066,000** Capital investment
- **1 x Energy Supply Contract**
  - ✓ Tallaght District Heating System
  - ✓ **€ 7,972,000** Capital investment
- Of the **€11.4m invested**:
  - €4.3m (**38%**) from the **Private** sector via **ESCos**
  - €5.5m (**48%**) from **grants**
  - €1.6m (**14%**) from the **Local Authority**
- Funding arrangement made possible by **Energy Performance Contracting**

WHAT'S THE **PROBLEM?**

Business-as-usual:

- Its **slow**, focus on **single technology** (CHP, Heat Pump, LED……)
- Results in small, **low value** projects
- Dependent on **building owner finance**
- All **risk** with project owner
- Frequent **cost overrun**
- **Poor results** (no Measurement & Verification) – **Rebound effect**

WHAT'S THE **SOLUTION?**

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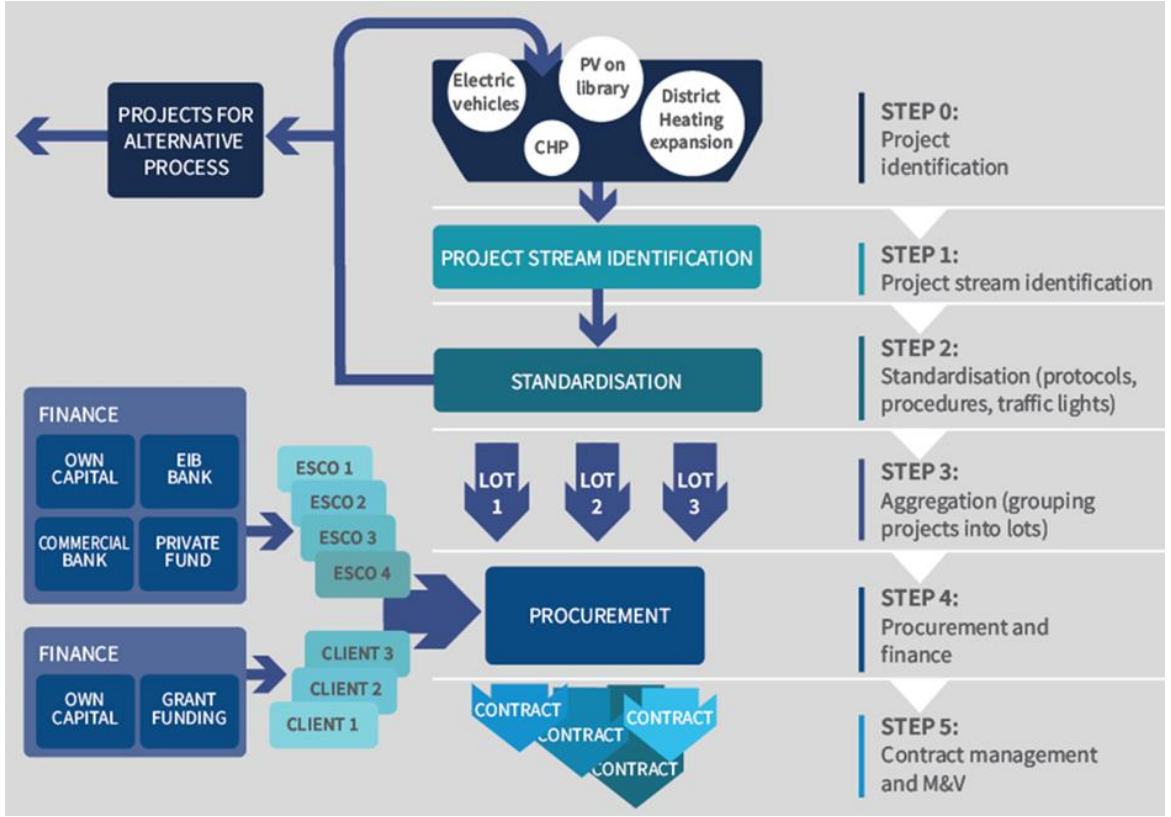
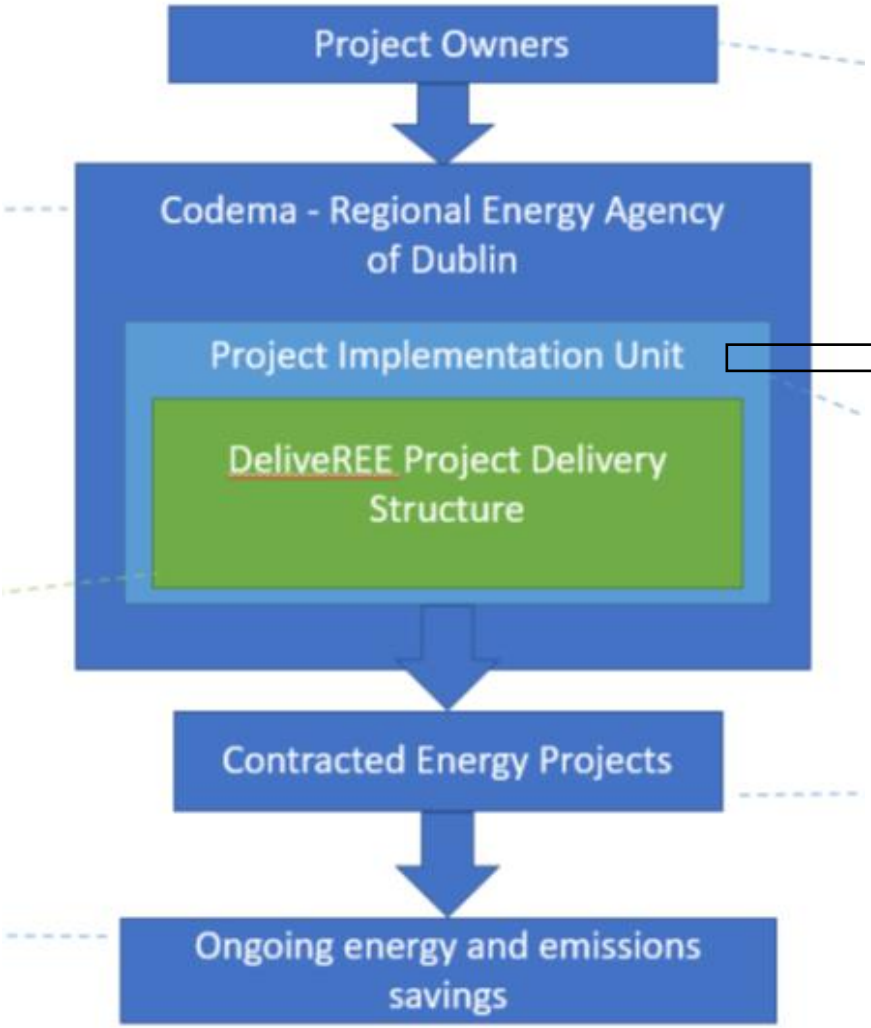
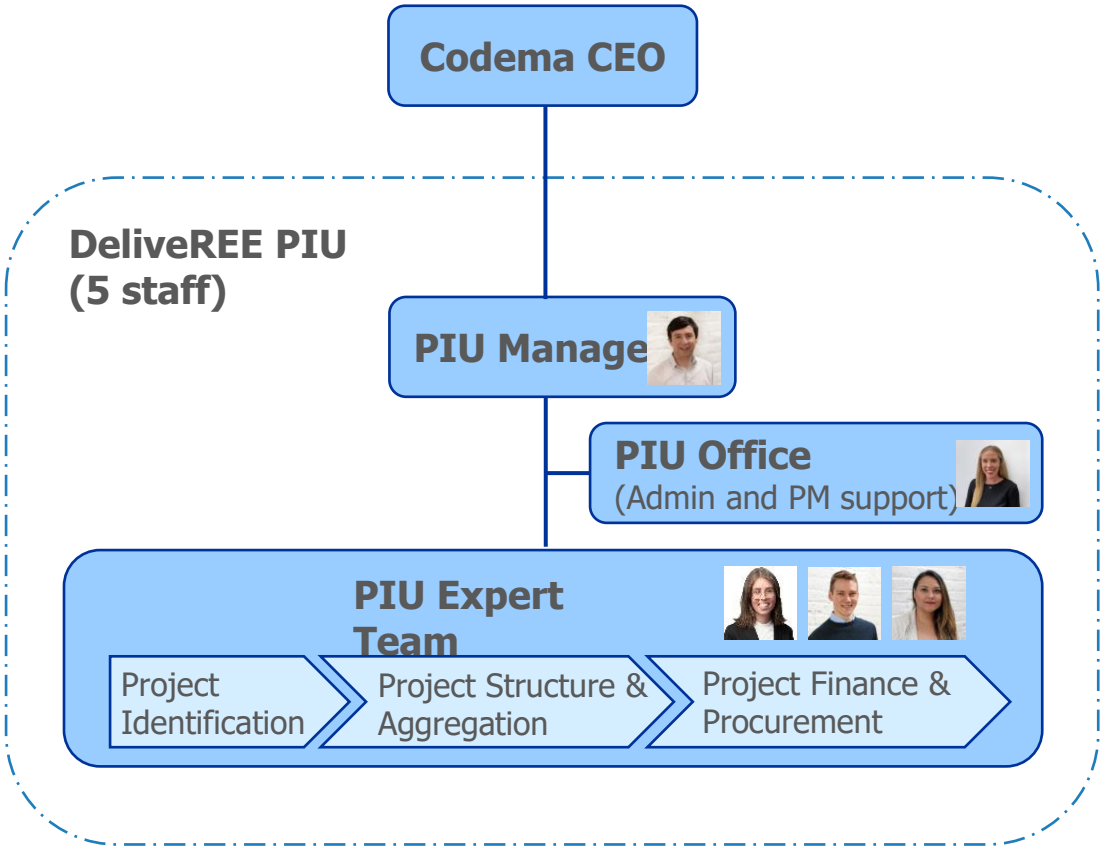
DeliveREE:

- '**One stop shop**' Project Implementation Unit
- **Standardises** project development
- **Aggregates** Projects
- Uses **Performance** Contracts
- Facilitates **Private Finance**

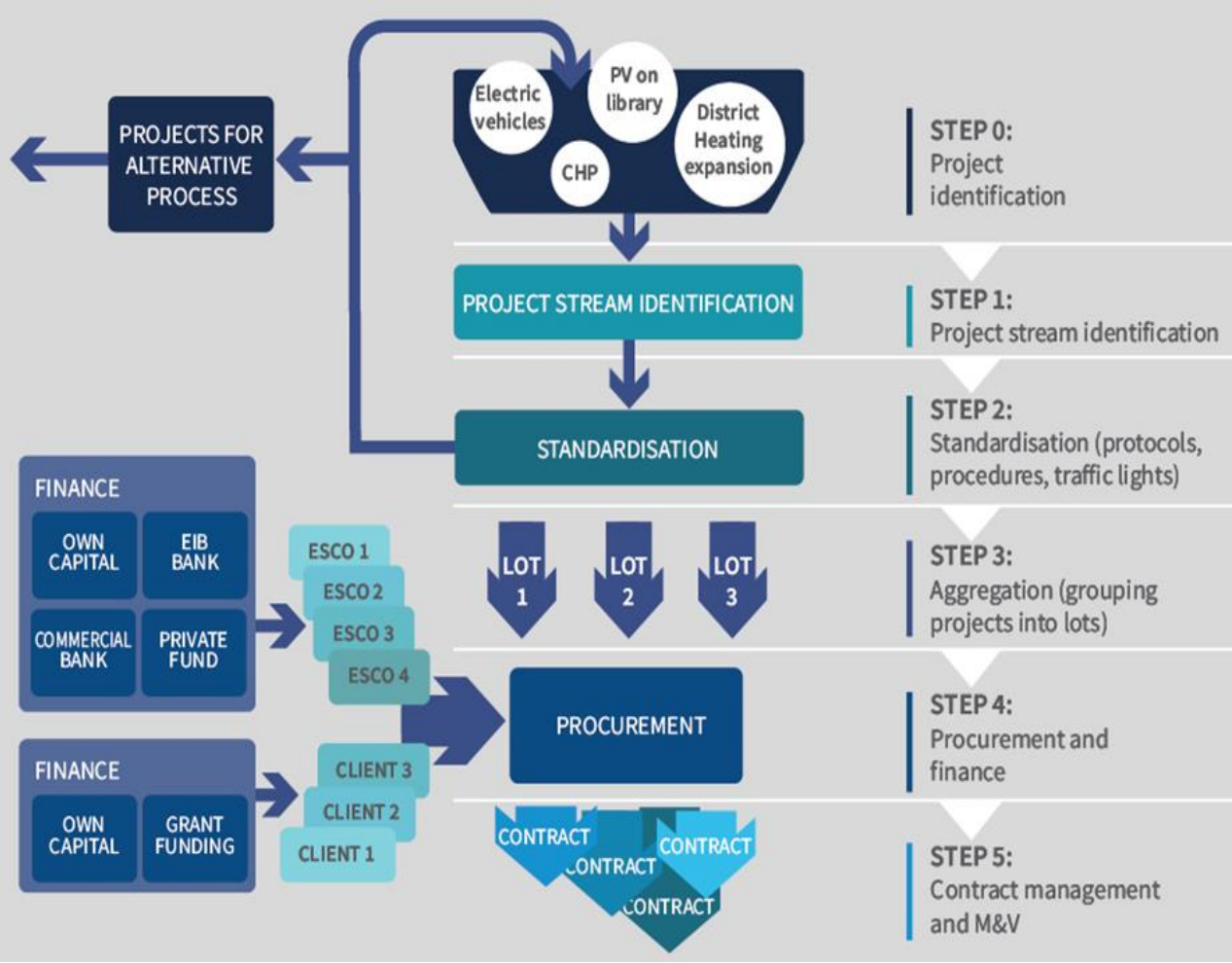


DELIVEREE - **PIU**





DELIVEREE - **STRUCTURE**



Project Development Structure:

1. Project Identification
2. Standardisation
3. Aggregation
4. Procurement & Finance
5. Contract Management and M&V

DELIVEREE **PROJECT PIPELINE**

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- We have identified **pipeline of 19 projects**.
- Includes **140 Local Authority buildings**
- Estimates CAPEX - **€20.4m**
- Estimates savings – 29% (**3,977 tCO2**)
- **Funding** structure: 10-20% project owner, 40-50% grant and 40-50% private financing

Location (area, town…)	Type of investment[1]	Description of the investment	Quantification [Buildings]	Current energy consump-	Energy savings (%)	Renewable energy production	Energy investment costs
DCC	Building Energy Efficiency	1 building for new CHP and LED lighting - Civic Offices	1	10,620,824	22%	-	1750,540
DCC	Building Energy Efficiency	Swan Leisure Centre for energy efficiency measures	1	4,338,474	21%	-	1387,858
DCC	Building Energy Efficiency	30 buildings for energy efficiency measures (LED, MF, PV)	30	6,446,637	20%	-	11,630,000
DCC	Building Energy Efficiency	11 buildings for energy efficiency	11	3,340,164	25%	-	1580,384
DCC	Building Energy Efficiency	2 Swimming Pools for Energy Efficient measures - Swan McDermot and	2	2,752,757	25%	-	1245,794
DLR	Building Energy Efficiency	4 buildings for energy efficiency measures - County Hall, Ballyogan depot, Harbour Square and	4	7,000,000	45%	-	11,835,642
DLR	Building Energy Efficiency	3 Leisure Centres for Energy Efficient refurbishment - Meadowbrook, Loughlinstown and Monkstown	3	6,446,349	30%	-	1600,000
DLR	Building Energy Efficiency	50 buildings for energy efficiency measures (LED, MF, PV)	50	9,704,711	10%	-	12,824,311
FCC	Building Energy Efficiency	3 buildings for energy efficiency measures - Sean de Cassty Hall, Draiocht Library Building, Grove Road	3	8,248,421	30%	-	11,714,574
FCC	Building Energy Efficiency	10 buildings for energy efficiency measures (LED, MF, PV)	10	4,670,248	20%	-	1750,000
FCC	Building Energy Efficiency	6 Horticop buildings for energy efficient Refurbishment	6	2,106,345	15%	-	1494,114
FCC	Electrical Vehicel Charging	EV charging hubs installed at 3 of the depots in Fingal (2 no 50kW DC fast chargers and 4 no 22kW AC chargers)	2	-	-	-	1100,000
SDCC	Building Energy Efficiency	2 Leisure Centres for Energy Efficient refurbishment - Clondalkin and	2	6,446,625	29%	-	1485,000
SDCC	Building Energy Efficiency	2 community buildings for energy efficiency measures including a theatre and one	2	874,885	25%	-	1164,381
SDCC	Building Energy Efficiency	2 Office buildings for energy efficient measures including County Hall and Clondalkin offices	2	5,447,451	15%	-	1710,225
SDCC	Building Energy Efficiency	15 buildings for energy efficiency measures (LED, MF, PV)	15	2,144,242	30%	-	1250,000
SDCC	Renewable Energy	Arthurstown landfill renewable energy project - 250 kVp solar export project to cover the base load of the leachate	1	1,445,000	10%	-	185,000
SDCC	Renewable Energy	Arthurstown landfill - 3 MW commercial PV farm, developed as a Community-led	0	-	-	4,445	14,000,000
SDCC	Electrical Vehicel Charging	EV charging hubs installed at 3 of the depots	1	-	-	-	1100,000
SDCC	District Heating	SDDH Extension - to connect Civic Theatre and PPI Group to DH system	2	445,000	12%	-	1485,271
Total/average			**146**	85,500,000	**29%**	**4,445**	**119,543,262**

DELIVEREE - DELIVERY OF RENEWABLE AND ENERGY EFFICIENCY PROJECTS ACROSS THE DUBLIN REGION

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Project Partners :

- Codema
- Four Dublin Local Authorities
- Resourceful Futures Ltd (UK)
- Philip Lee Solicitors Ltd
- Sustainable Development Capital LLC (SDCL)

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Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Comhairle Contae Fhine Gall
Fingal County Council

dlr
Comhairle Contae County Council

Comhairle Contae Átha Cliath Theas
South Dublin County Council

SDCL

PHILIPLEE

DELIVEREE - DELIVERY OF RENEWABLE AND ENERGY EFFICIENCY PROJECTS ACROSS THE DUBLIN REGION

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Project Advisory Board:

- Department of the Environment Climate & Communications (**DCCAE**)
- Department of Public Expenditure and Reform (**DPER**)
- National Development Finance Agency (**NDFA**)
- Jožef Stefan Institute (**IJS**) **Slovenia**
- Sustainable Energy Authority of Ireland (**SEAI**)
- **Lawler** Sustainability **(ESCo)**
- Association of Irish Energy Agencies **(AIEA)**
- Health Service Executive **(HSE)**

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

An Roinn Caiteachais Phoiblí agus Athchóirithe
Department of Public Expenditure and Reform

AIEA
ASSOCIATION of IRISH ENERGY AGENCIES

Jožef Stefan Institute

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

LAWLER SUSTAINABILITY

An Ghníomhaireacht Airgeadais d'Fhorbairt Náisiúnta
National Development Finance Agency

HSE

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Section 02

The Reality

GUIDANCE DOCUMENT

- Output of second work package
- Interviewed 14 EPC experts across Ireland and Europe
- EPC market from communication, risk, technical, procurement, finance and legal angles
- Contract Cheat Sheet developed in response to a lack of shared understanding

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Table 1 Contract Cheat Sheet

EPC related term		Standard Works Contract	EnPC
General Terms			
Contract elements	Works	Works only	Included
	Services/Supply	Not included	5-20 years
	Performance Guarantee	Not included	Included
Project complexity	Single technology/low complexity	Used for	Suitable for
	Deep Retrofit		
Distribution of performance risk	Client holds risk	Client holds most to all risk	Client holds minimal risk
	Contractor holds risk	Contractor holds minimal risk	Contractor holds most to all risk
Balance sheet status	On	Mostly on	Depends on Client appetite, contract structure, etc
	Off	Cannot be off balance sheet	
Project Funding	Client	Up to 100%	Up to 100%
	Government Grants	Up to 50%*	Up to 30%*
	Third Party Finance	Not applicable	Up to 100%
Works			
Design and specifications development	Standard	Client develops design pre-procurement	Not suitable for contract/procurement type
	Outcome-based	Not suitable for contract/procurement type	Client specifies outcome, not design
New Equipment ownership	Client owned	In a typical works contract, the Client owns the equipment installed	With compensation to contractor for early termination
Maintenance of existing Equipment	Client	Existing equipment not considered in a standard works contract	Depends on contract - not relevant in ESCs, client or contractor in EPCs
	Contractor		
Testing, Commissioning and Defects responsibilities	Contractor	Contractor tests and commissions, low accountability for defects post-handover	Contractor tests and commissions, incentivised to correct defects throughout supply/service period
Services and Supply			
Services	Throughout contract period	Services not included in contract	5-20 years
Maintenance Responsibilities	New equipment	Services not included in contract	Contractor to maintain & replace
	Existing equipment		Maintenance depends on contract; Client pays for replacement
Handover/re-commissioning responsibilities	Contractor	Services not included in contract	Contractor to perform full re-commissioning and hand over fully operational system

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101032833

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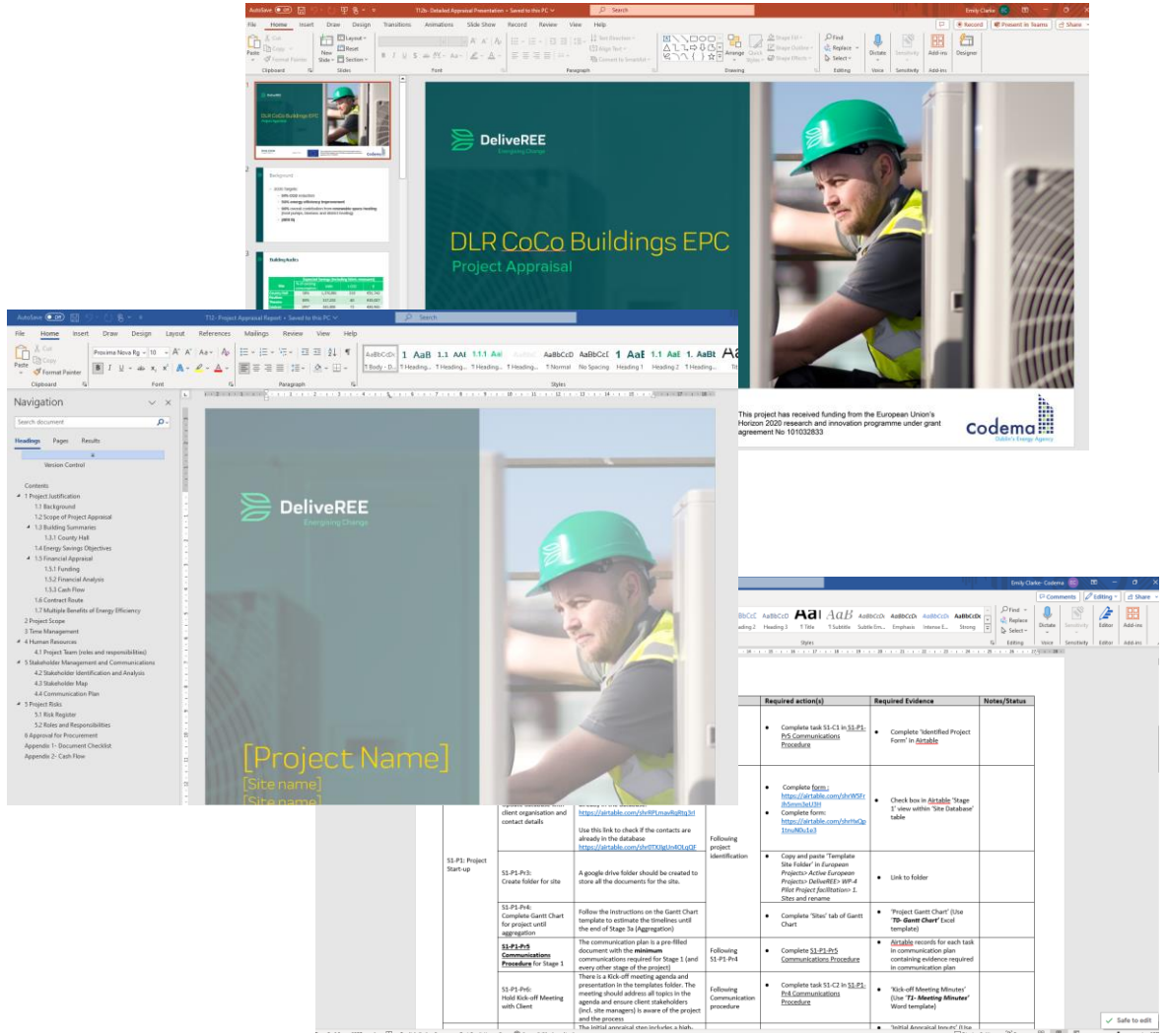
PROTOCOLS AND PROCEDURES

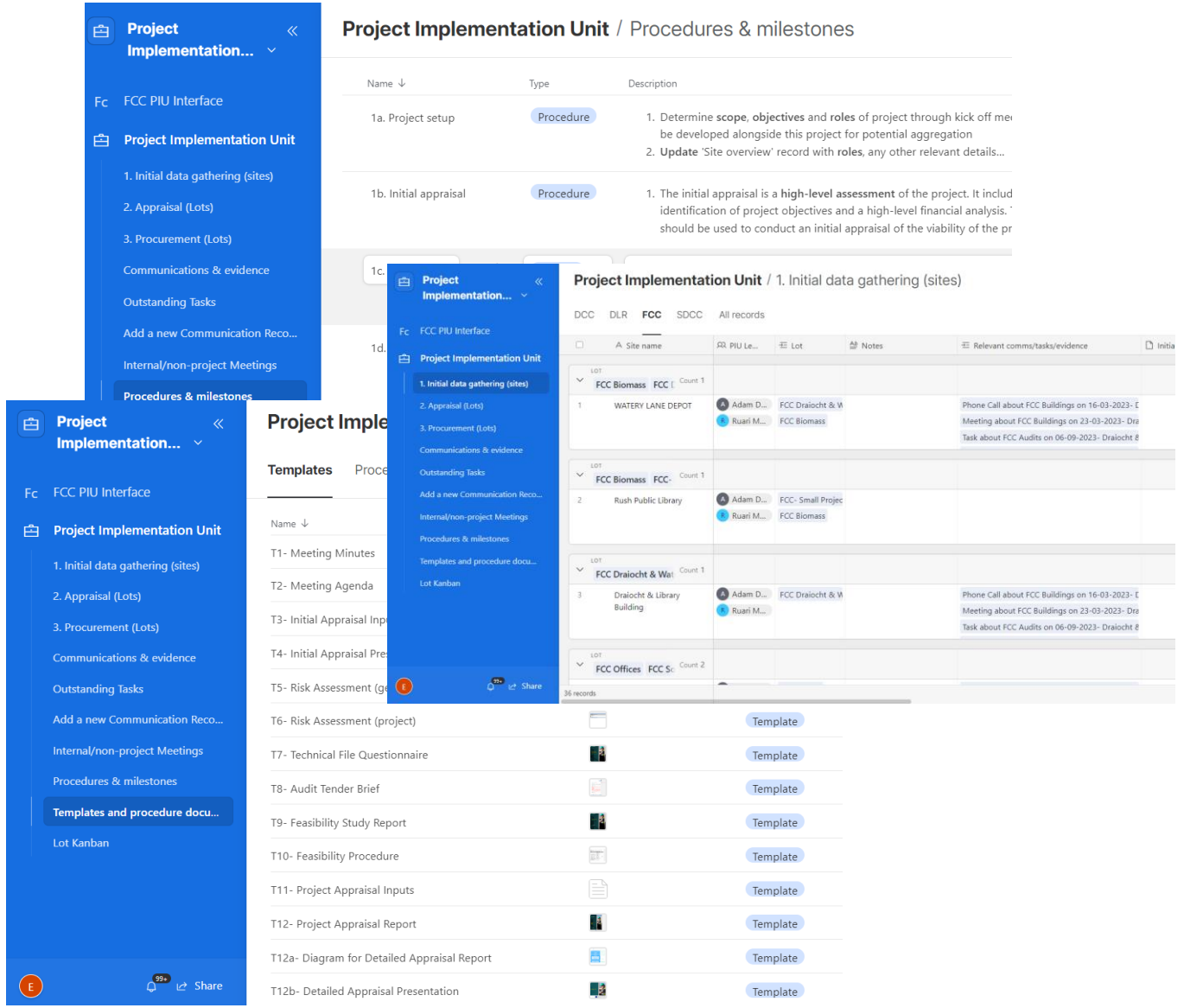
- Output of Work Package 3
- Procedures and protocols for how to develop a project
- Includes standardised template documents



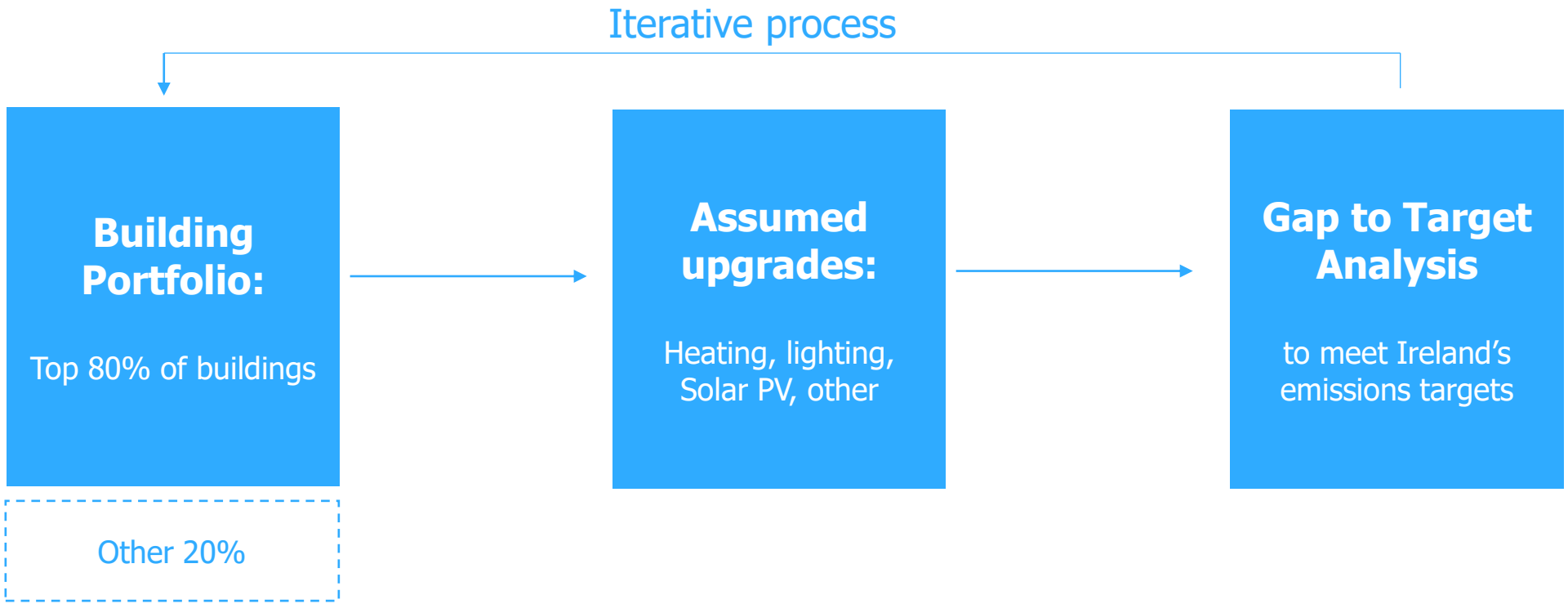
PROTOCOLS AND PROCEDURES

- Online platform developed by Codema

- Central place to:
  - Understand project development process
  - Access templates
  - Record progress
  - Record communications



GAP TO TARGET ANALYSIS



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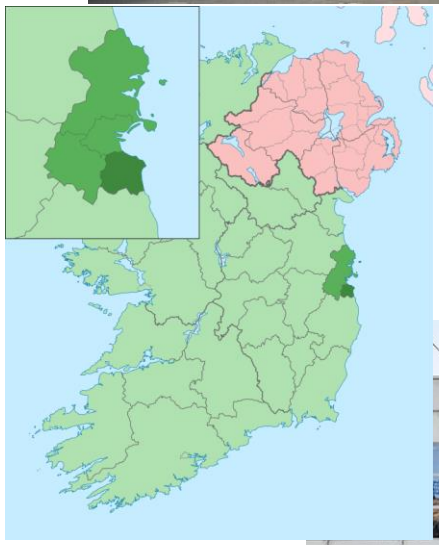
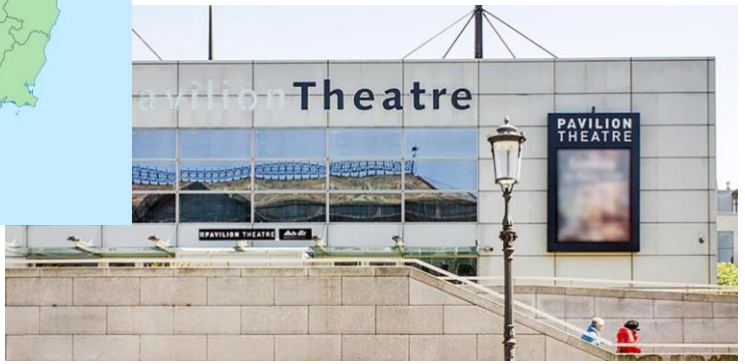
Section 03

The Projects

PROJECTS- DLR ENERGY PERFORMANCE CONTRACT

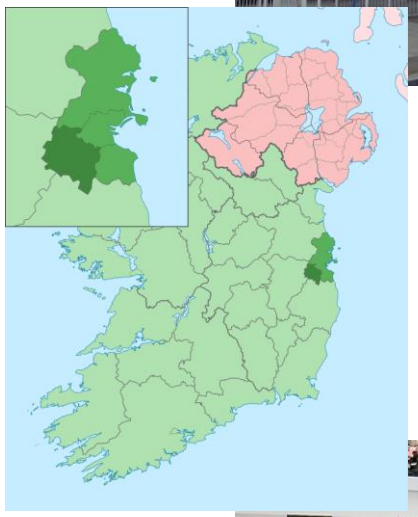
- **Project Type:** Energy Performance Contract
- **Client:** Dún Laoghaire-Rathdown County Council
- **Project value:** €3.1 million
- **Project scope:**
  - 3 buildings: County Hall, large library, theatre
  - Holistic upgrades including building fabric, heat pump, BMS, LED, Solar PV etc.
- **Project Financing:**
  - 45% Client: 45% Pathfinder funding: 10% ESCo
  - NPV of €400k
  - Payback of 10.5 years

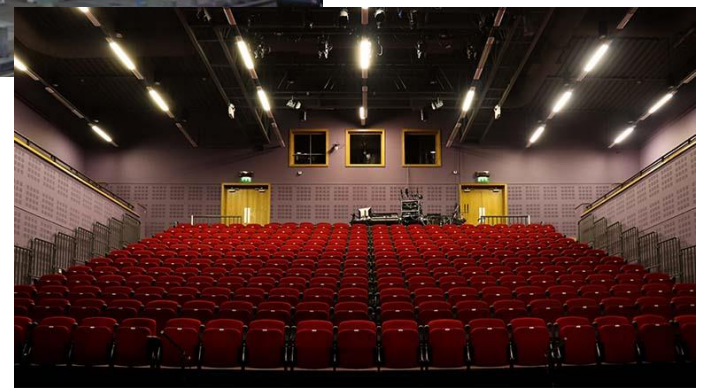




PROJECTS- SDCC ENERGY PERFORMANCE CONTRACT

- **Project Type:** Energy Performance Contract
- **Client:** South Dublin County Council
- **Project value:** €2.5 million
- **Project scope:**
  - 5 buildings: Civic Offices, smaller offices, theatre, 2 leisure centres
  - Holistic upgrades including building fabric, heat pump, BMS, LED, Solar PV etc.
- **Project Financing:**
  - 35% Client: 39% Pathfinder funding: 26% ESCo
  - NPV of €729k
  - Payback of 8.3 years

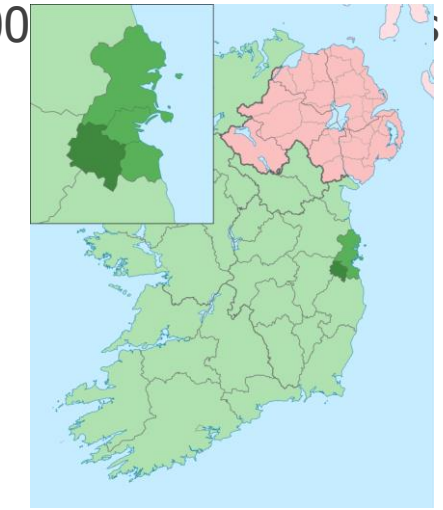




PROJECTS- ARTHURSTOWN LANDFILL

Small Scale Solar PV

- **Project Type:** Energy Performance Related Payment (works contract + guarantee clause)
- **Client:** South Dublin County Council
- **Project value:** €275,000 +€27,500
- **Project scope:** ~200kW Small Scale Solar PV
- **Project Financing:**
  - 90% Client : 10% ESCo
  - NPV €243,000



Large Scale Solar PV

- **Project Type:** Feasibility Study
- **Client:** South Dublin County Council
- **Project value:** TBC (approx. €6 mill)
- **Project scope:** ~5 MW Large Scale Solar PV
- **Project Financing:** TBC

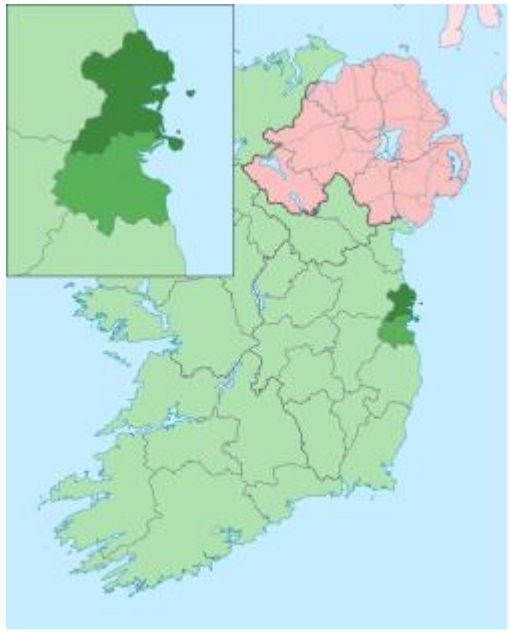
PROJECTS- FCC ENERGY SUPPLY CONTRACTS

Solar PV

- **Project Type:** Energy Supply Contract
- **Client:** Fingal County Council
- **Project value:** approx. €460k
- **Project scope:** ~320kW of solar PV on three buildings
- **Project Financing:** TBC

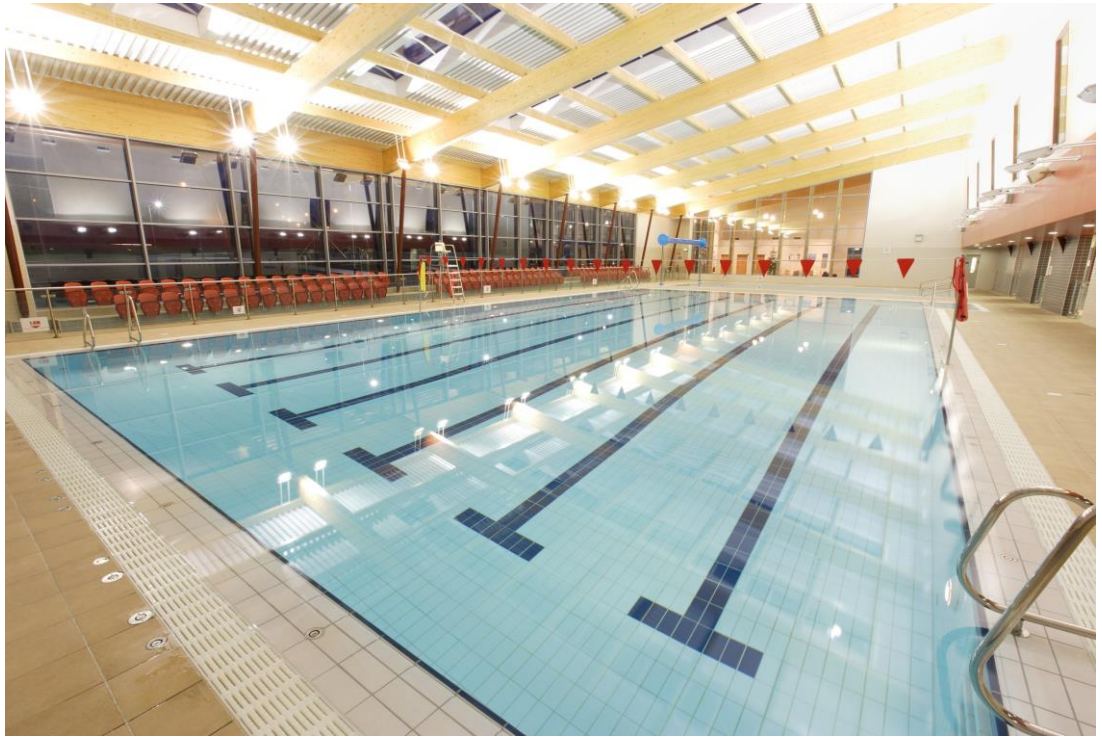
Biomass Boiler

- **Project Type:** Energy Supply Contract
- **Client:** Fingal County Council
- **Project value:** approx. €500k
- **Project scope:** Biomass boilers for 4 buildings
- **Project Financing:** TBC



PROJECTS- MID EAST ENERGY UNIT LEISURE CENTRE UPGRADES

- **Project Type:** Energy Performance Contract
- **Client:** Meath County Council, Kildare County Council and Wicklow County Council
- **Project value:** €3.8 million
- **Project scope:**
  - 7 Leisure Centres (with Swimming Pools)
  - Holistic upgrades including some fabric, heat pump, BMS, LED, Solar PV, etc
- **Project Financing:**
  - 45-50% Client: 30-45% Pathfinder funding: 10-20% ESCo
  - Payback between 10-12 years



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Section 04

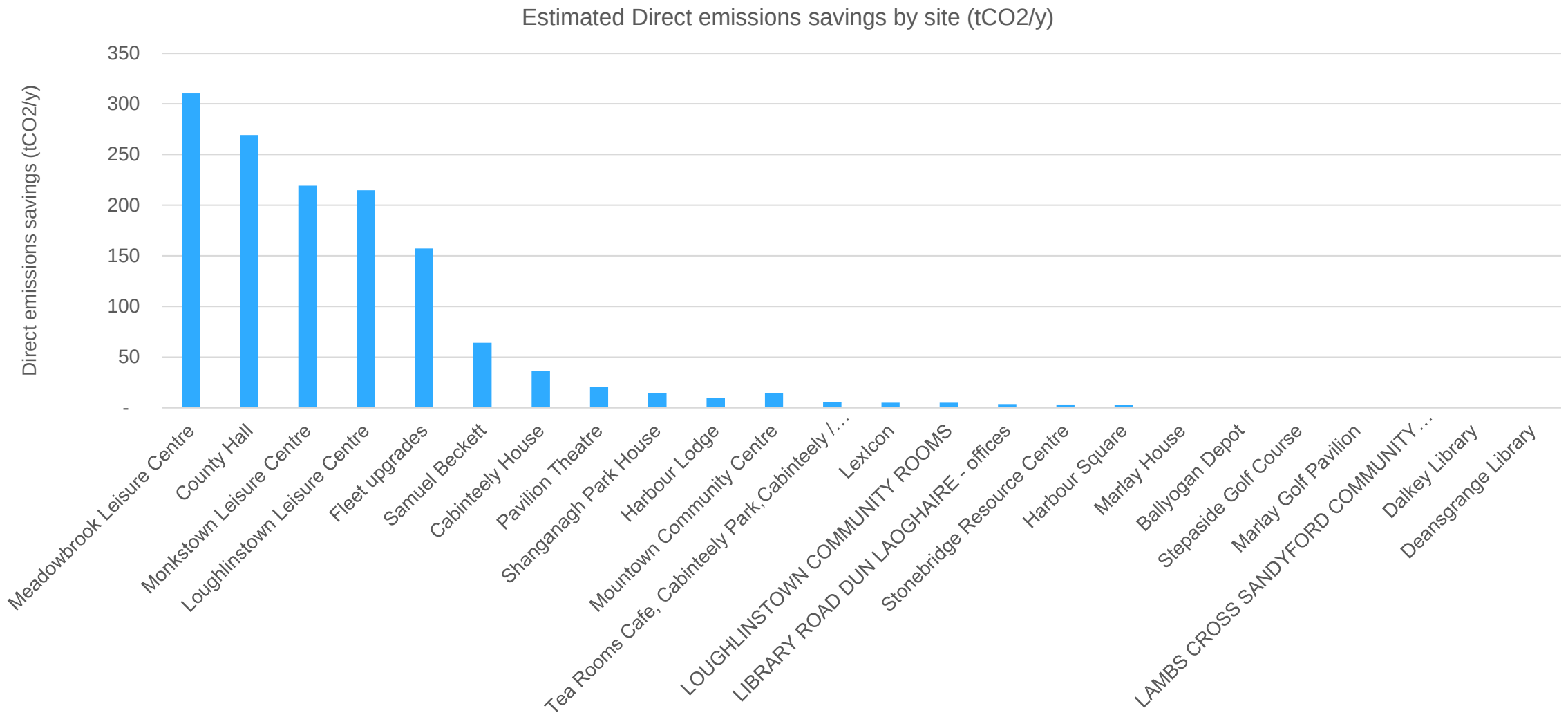
The Learnings

THE PLAN – **BUILD UPON** OUR ENPC **EXPERIENCE**

- Funding Share:
  - €4.3m (**38%**) from the **Private** sector via **ESCos**
  - €5.5m (**48%**) from **grants**
  - €1.6m (**14%**) from the **Local Authority**

- The Plan: Scale up and Expand this Project Delivery Model using **Energy Performance Contracting**

LESSON 1: **REVIEWING THE PROJECT PIPELINE**



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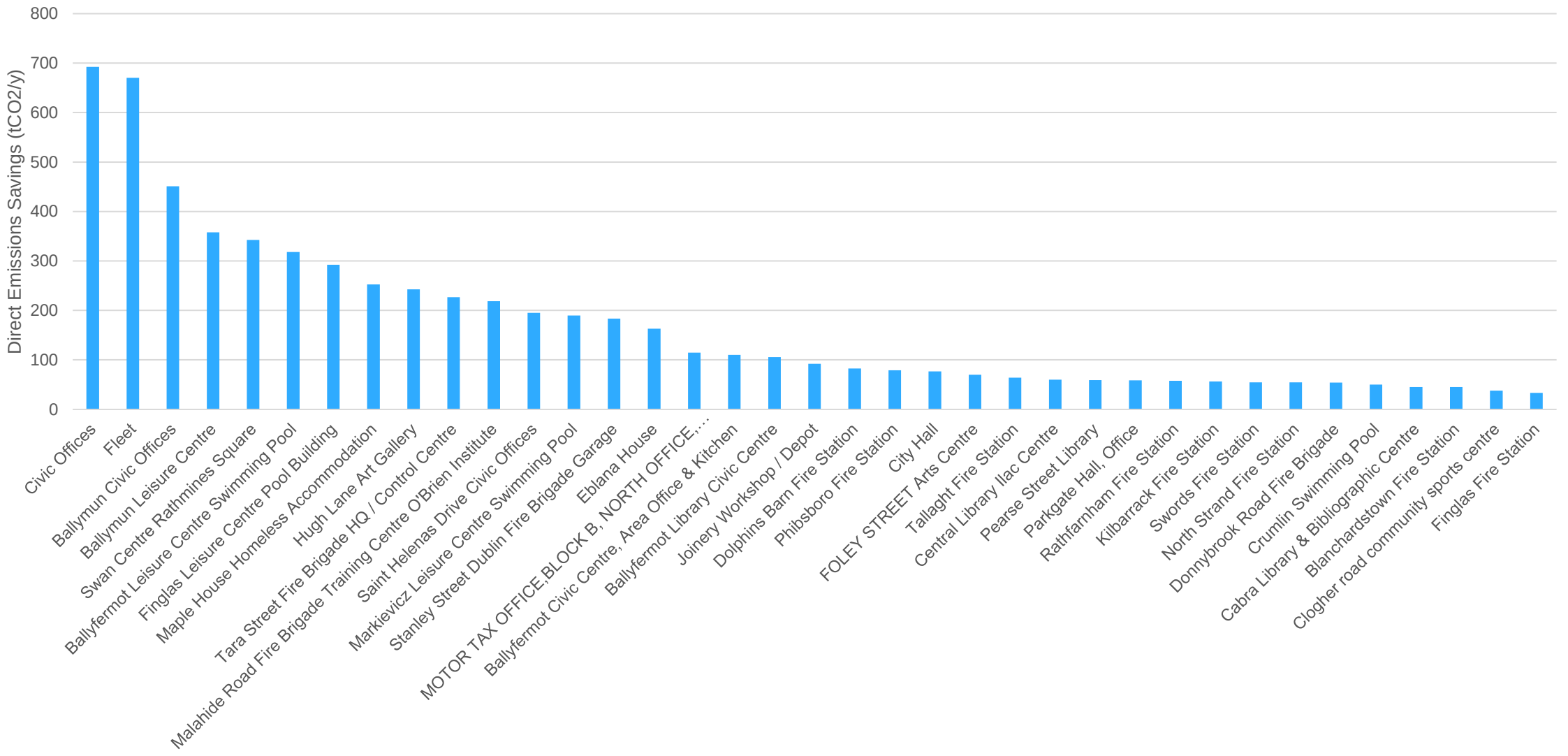

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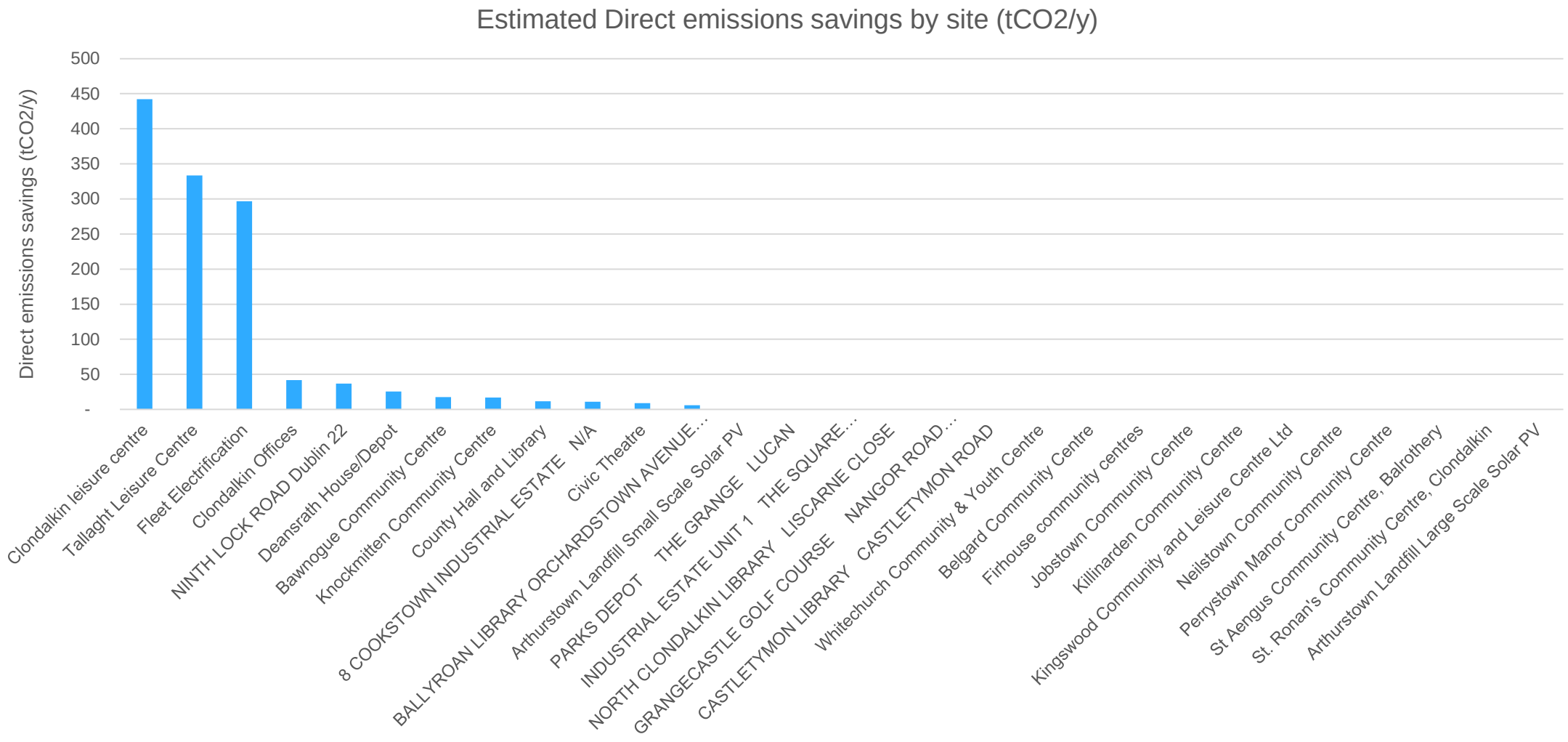

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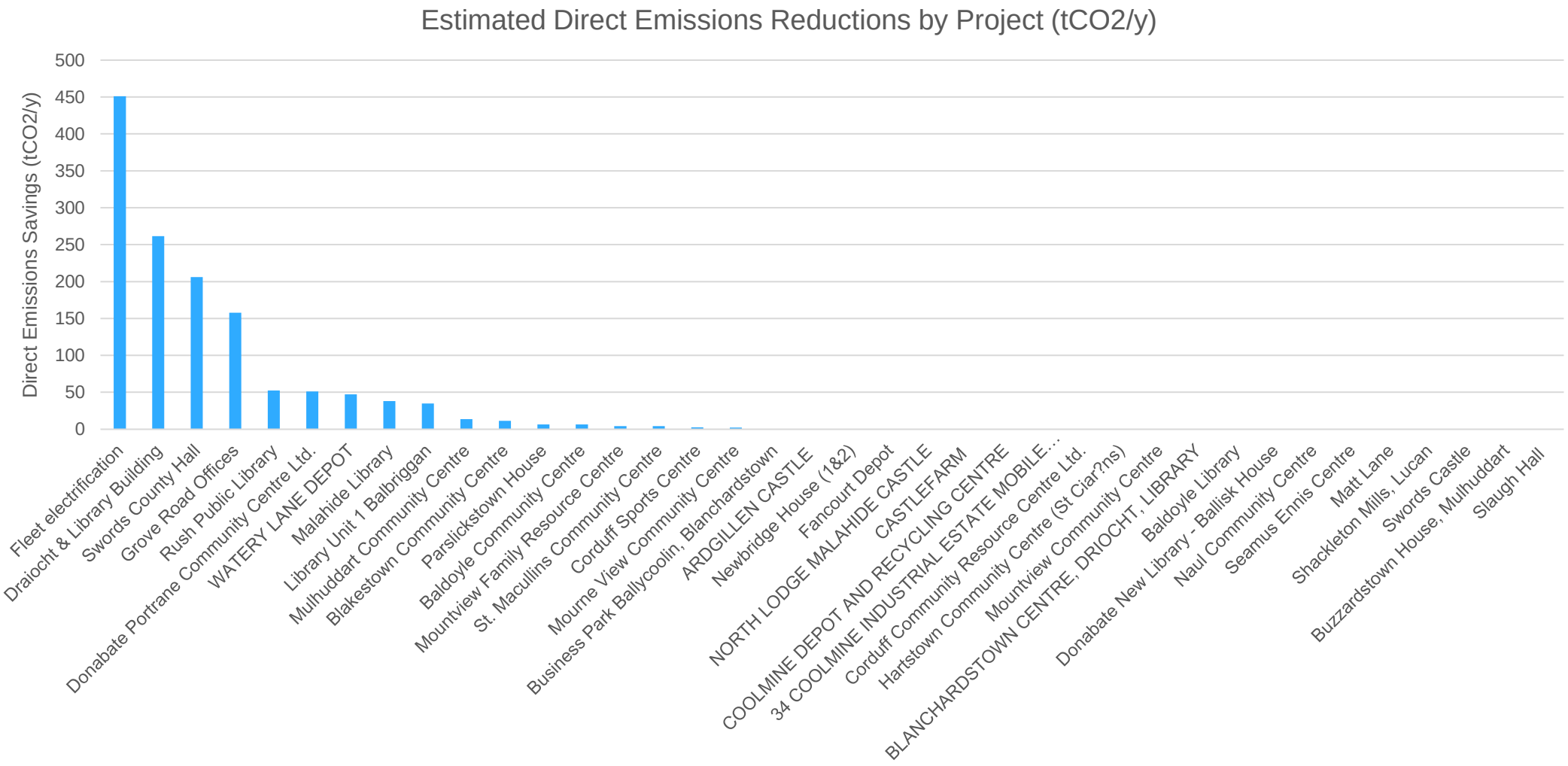
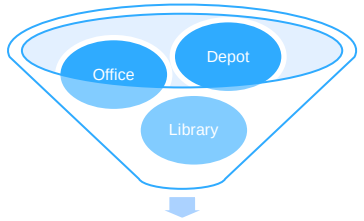


LESSON 2: **BUILDING DECARBONISATION STRATEGY**



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Priority List of Buildings

Deep Retrofit (Building Site)

Traditional Building Contract

All measurers:

Fabric: Wall insulation, roof insulation, windows and doors

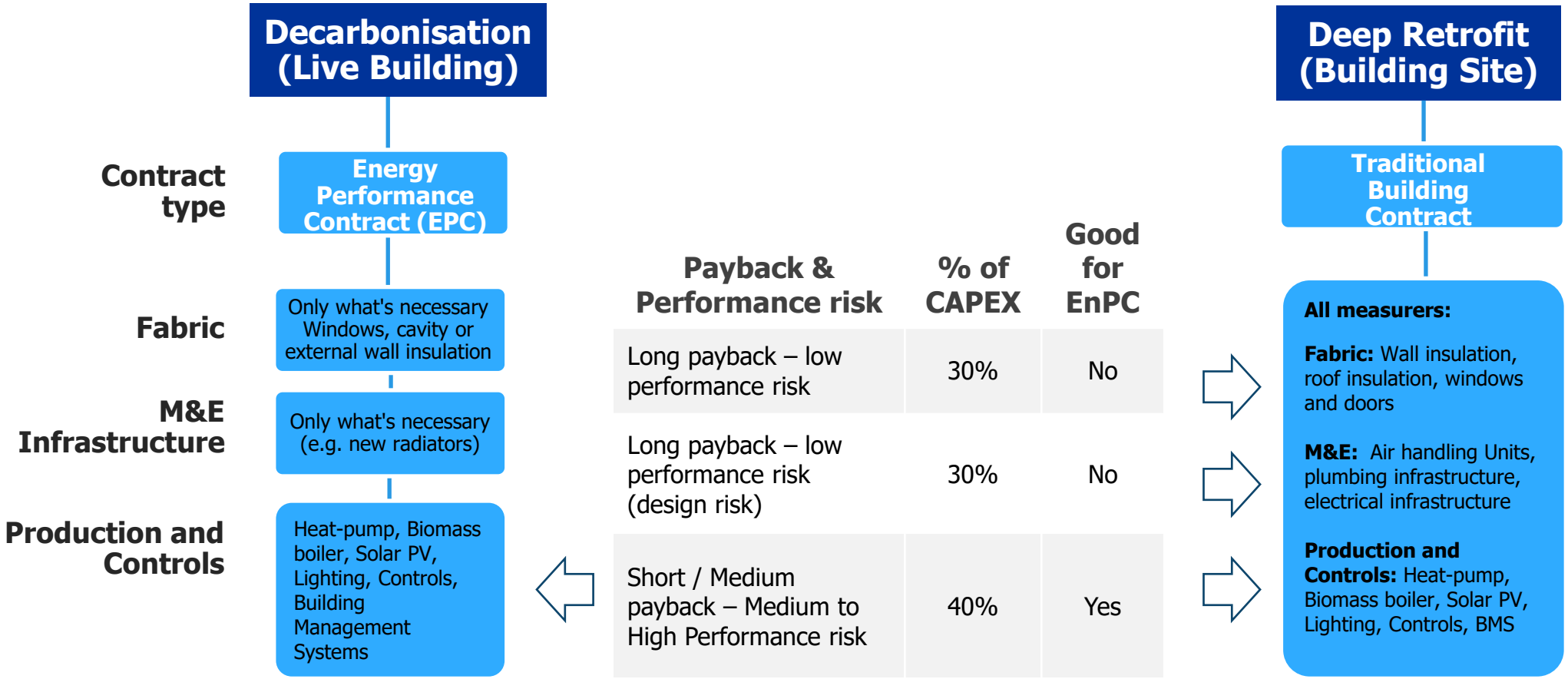
M&E: Air handling Units, plumbing infrastructure, electrical infrastructure

Production and Controls: Heat-pump, Biomass boiler, Solar PV, Lighting, Controls, BMS

Decarbonisation (Live Building)

Contract type	Energy Performance Contract (EPC)	Energy Supply (ESC) or Performance Guarantee (EPG)
Fabric	Only what's necessary Windows, cavity or external wall insulation	
M&E Infrastructure	Only what's necessary (e.g. new radiators)	
Production and Controls	Heat-pump, Biomass boiler, Solar PV, Lighting, Controls, Building Management Systems	**Single technology projects** – Heat-pump, Biomass boiler, Solar PV, Lighting

LESSON 3: **WHEN TO USE ENPC** AND WHEN TO **GO TRADITIONAL**



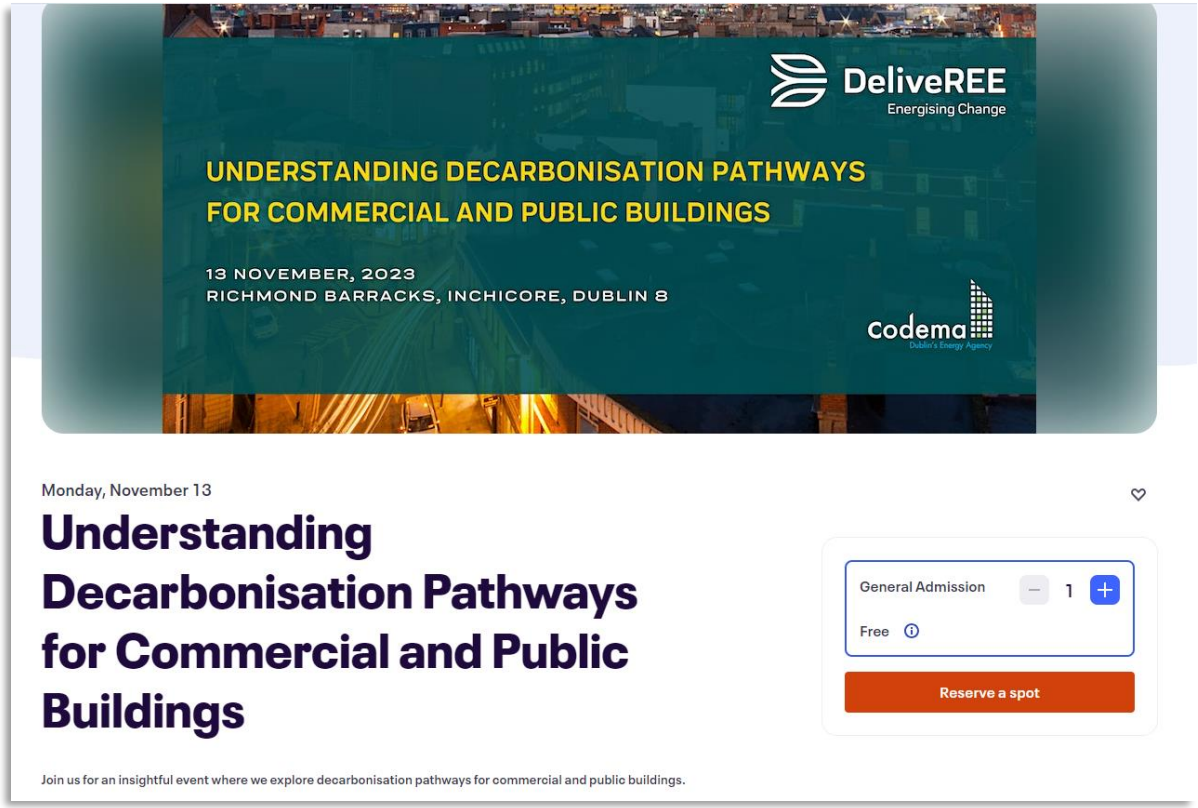
LESSON 4: THE **CHALLENGES – PROCURING AN ESCO**

- It's a mix of:
  - Market **growth –** *Lack of projects*
  - **Contractor** (ESCo) engagement – *Lack of ESCos*
  - **Supply** and **demand**

Why?

1. *The **bid cost risk** has **increased***
2. *The **standard EnPC model** no longer works and is **not what** the **Local Authority needs***

MARKET ENGAGEMENT EVENT



- The **Aim**:
  - Understand the **challenges faced by each** stakeholder
- Target **Audience**:
  - Contractors
  - Market Facilitators
  - Building portfolio owners
- The 5 **Big Asks**
- **Interviews** with key stakeholder

LESSON 5: **RENOVATION ROADMAP** TO ZERO CARBON

An **Energy Performance Contract**:

- Provides the **contract structure** for a **planned**, phased **decarbonization** of our buildings
- This allows for the **phasing out of existing assets** (boilers, CHPs, etc.) that may be relatively recent installations and have a structured plan for replacement
- **EnPC contractor** (or ESCo) can prepare **an implementation plan** with the building owner so that a **structured investment plan** put in place
- Single **procurement** competition!

ENERGY EFFICIENCY TO DECARBONIZATION

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1. **Energy Efficiency Project** (Leisure Centers)
   - CHP, Boilers, BMS controls, LED lighting, Pumps, Fans, etc.

Projected Financial Analysis		**Performance Contract**
Installation Cost	Client	**€299,700 (54%)**
	ESCO	**€255,300 (46%)**
	Grant (Pathfinder)	€ 0
Annual Energy Savings	(kWh)	**1,987,092**
Annual Energy Cost Savings	(€)	**€125,000**
Estimated payback	(years)	4.3
Net Present Value	(€)	€410,783

ENERGY EFFICIENCY TO DECARBONIZATION

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2. **Decarbonization Project** (Office Building and Library)
   - **Heat pump, Windows,** Solar PV, BMS controls, LED lighting, Pumps, Fans, etc.

Projected Financial Analysis		**Performance Contract**
Installation Cost	Client	**€ 1,085,000 (35%)**
	ESCO	**€ 465,000 (15%)**
	Grant	**€ 1,550,000 (50%)**
Annual Energy Savings	(kWh)	**1,779,000**
Annual Energy Cost Savings	(€)	**€ 211,000**
Estimated payback	(years)	9.4
Net Present Value	(€)	€ 785,000

ENERGY EFFICIENCY TO DECARBONIZATION

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Dublin's Energy Agency

2. **Decarbonization Project** (Office Building and Library)
   - **Heat pump, Windows,** Solar PV, BMS controls, LED lighting, Pumps, Fans, etc.

Projected Financial Analysis		Performance Contract
Installation Cost	Client	**€ 1,085,000 (35%)**
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	Grant	**€ 1,550,000 (50%)**
Annual Energy Savings	(kWh)	**1,779,000**
Annual Energy Cost Savings	(€)	**€ 211,000**
Estimated payback	(years)	9.4
Net Present Value	(€)	€ 785,000

- Total investment - **€3.1m**
- Windows account for **40%** and have ~90 year payback
- Heat pumps account for **25%** and no cost savings
- Project has **positive NPV**
- But **needs grant aid support**

CONCLUSION AND NEXT STEPS

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1. **Reframe the EnPC message** (from the building owner perspective, Contracted renovation roadmap or pathway to Zero)
2. **Engage with the ESCo market** (gain a better understanding of the challenges and risk they face and present a better project to the market)
3. **Revaluate the pathways for Private Finance** to support our pipeline of projects (not just via the ESCo, recognize the high-cost low-risk measures)
4. **Further develop the contract selection process** (recognizing the appropriate role of both performance and traditional contract structures)
5. **Further develop the EnPC contract template** (recognizing the changes in our EnPC model and the staged renovation process, pathway to zero)

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Thank You

Joe Hayden, Senior Executive Engineer
Emily Clarke, Energy Engineer

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