Corporate PPA policy in Ireland

Final Report

December 2020

Preface

- This report was prepared by Baringa for the Sustainable Energy Authority of Ireland (SEAI) to develop a shortlist of policy options for consideration by government, aimed at improving the market environment for corporate power purchase agreements (CPPAs) in the Irish Single Electricity Market.

- The underlying analysis, Baringa's engagement with stakeholders, and the preparation of the report took place over the period November 2019 to March 2020. It therefore pre-dates key events of 2020, such as:
  - The COVID-19 global pandemic and associated lockdown impacts.
  - Successful completion of the first auction under the Renewable Electricity Support Scheme (RESS-1).
  - Publication of the final National Energy and Climate Plan (NECP) for Ireland.
  - A small number of new CPPA public announcements, including those by Amazon for the 115 MW Ardderroo wind farm, and by Facebook for the 28.8 MW Lisheen 3 wind farm.

- This report has not been updated to reflect these and other developments, is published "as-is", and it should be read in that context.

December 2020

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Executive summary

Executive summary – Context

The Government is seeking to deliver 6 TWh of new renewable generation under corporate PPAs by 2030 – equivalent to around 35% of all new generation capacity

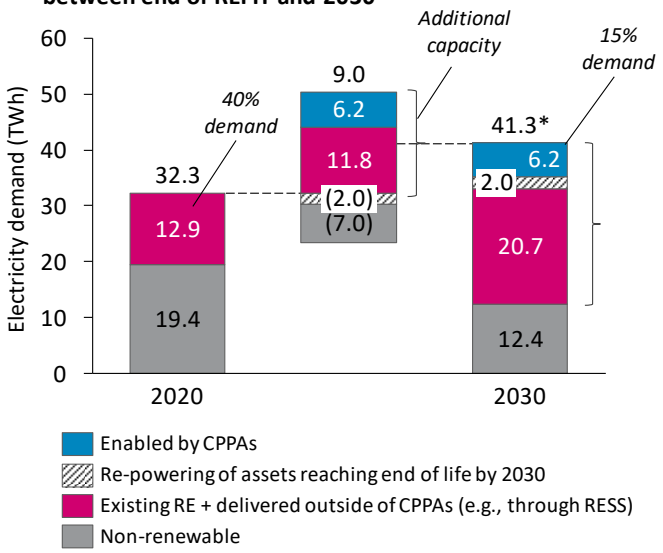
- The Government has set a target of achieving a renewable share of electricity consumption of 70% by 2030 as part of its Climate Action Plan. This is supported by a new Renewable Electricity Support Scheme (RESS) designed to deliver up to 55%, and Corporate Power Purchase agreements (CPPAs) are expected to play a material part in delivering the remainder. SEAI has engaged Baringa to develop a shortlist of policy options for consideration by Government aimed at improving the market environment for corporate PPAs in the Irish Single Electricity Market. The project has been governed by a Steering Group consisting of key public sector and industry representatives.

- The rationale for targeting the delivery of renewables under corporate PPAs has three main aspects. First, lowering the PSO burden by limiting the volume of renewable energy which must be sourced via the RESS auctions. Second, ensuring corporations play their part in sustainably meeting the additional energy demand they bring to the system. Third, helping the transition from state-led to market-led deployment of renewables.

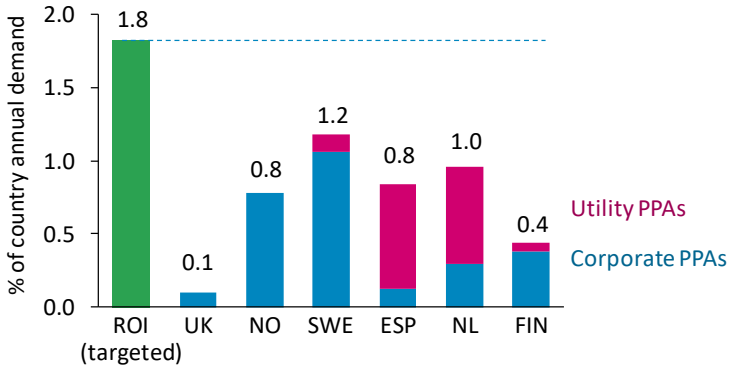
- A target of 15% of electricity consumption suggests that up to **6 TWh of additional electricity generation** by 2030 must be underpinned by CPPAs – this is **c.35% of all new generation capacity**. This is equivalent to 2.3 GW of onshore wind or over 6 GW of solar PV. The required deployment rate under CPPAs through to 2030 would be broadly equivalent to the average deployment rate under REFIT since 2015.

- While other European markets have achieved this absolute level of CPPA deployment in recent years, relative to the size of the Irish market it represents a significant step up in the scale of deployment from any other market to date.

RoI renewable electricity penetration targets between end of REFIT and 2030



Average volume newly contracted under PPA each year (2017-19)



Executive summary – European corporate PPAs

CPPA volumes have been growing in certain markets in Europe, such as the Nordics and GB, where subsidies have been removed, or support leaves generators with some market price exposure

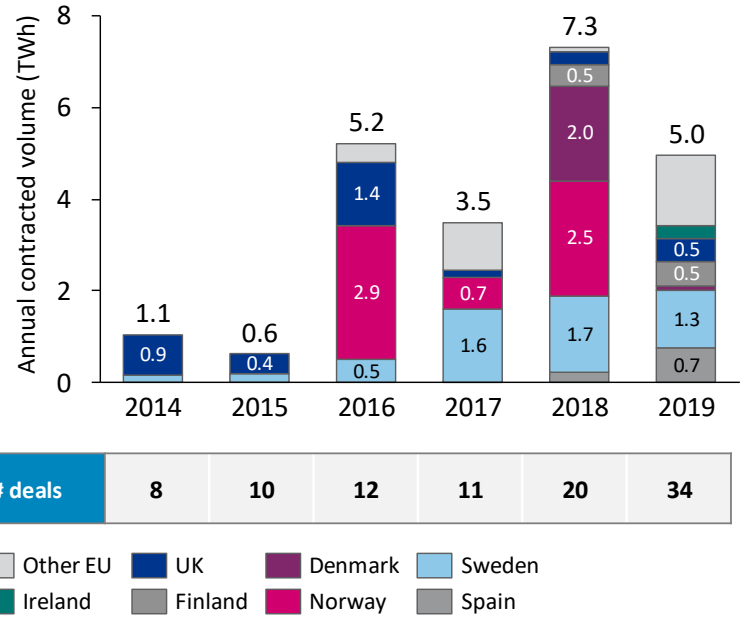
- Corporate PPAs are an agreement for a business to purchase electricity directly from a generator, most often under a form of long-term contract. This differs from the 'standard' approach of businesses purchasing power from a licensed electricity supplier, and of generators selling their output to those suppliers at the 'market' price of power – which varies. A key feature of CPPAs is that they are most often struck at some sort of fixed price, usually over a long time period.

- Corporates see PPAs as a way to decarbonise their electricity supply in a way which is traceable, and can demonstrate additionality, as well as creating longer term cost certainty and in some instances cost savings. Developers have looked to cPPAs to replace subsidies as a way to generate longer term revenue certainty to support financing.

- CPPA volumes have been growing in Europe, averaging about 5 TWh/year since 2015, with further volumes of fixed price PPAs signed by utilities in some markets since 2017. This activity has not been uniform across Europe, it has been concentrated on several key markets, notably the Nordics, Spain, the Netherlands and GB. A key driver in these markets has been the removal of subsidies – or support in the form of certificates that leave some exposure to wholesale prices, which will not be the case with the RESS in Ireland.

- Our experience in CPPAs suggests that the following four 'pillars' will need to be present to enable a material contribution from CPPAs in Ireland in the 2020s:
  - Supply: a pool of projects seeking cPPAs as a route-to-market
  - Value: projects with the right combination of price, additionality, traceability, and price certainty to meet corporate criteria
  - Risk: appropriate allocation of risk between the counterparties
  - Execution: Simplified contractual terms, greater liquidity and more transparent price discovery

Estimated* European Corporate PPA volumes (2014-2019)
TWh p.a. contracted



Executive summary – Stakeholder engagement

We engaged widely with stakeholders at the outset of this work, conducting 24 small group interviews and an open workshop with 64 participants

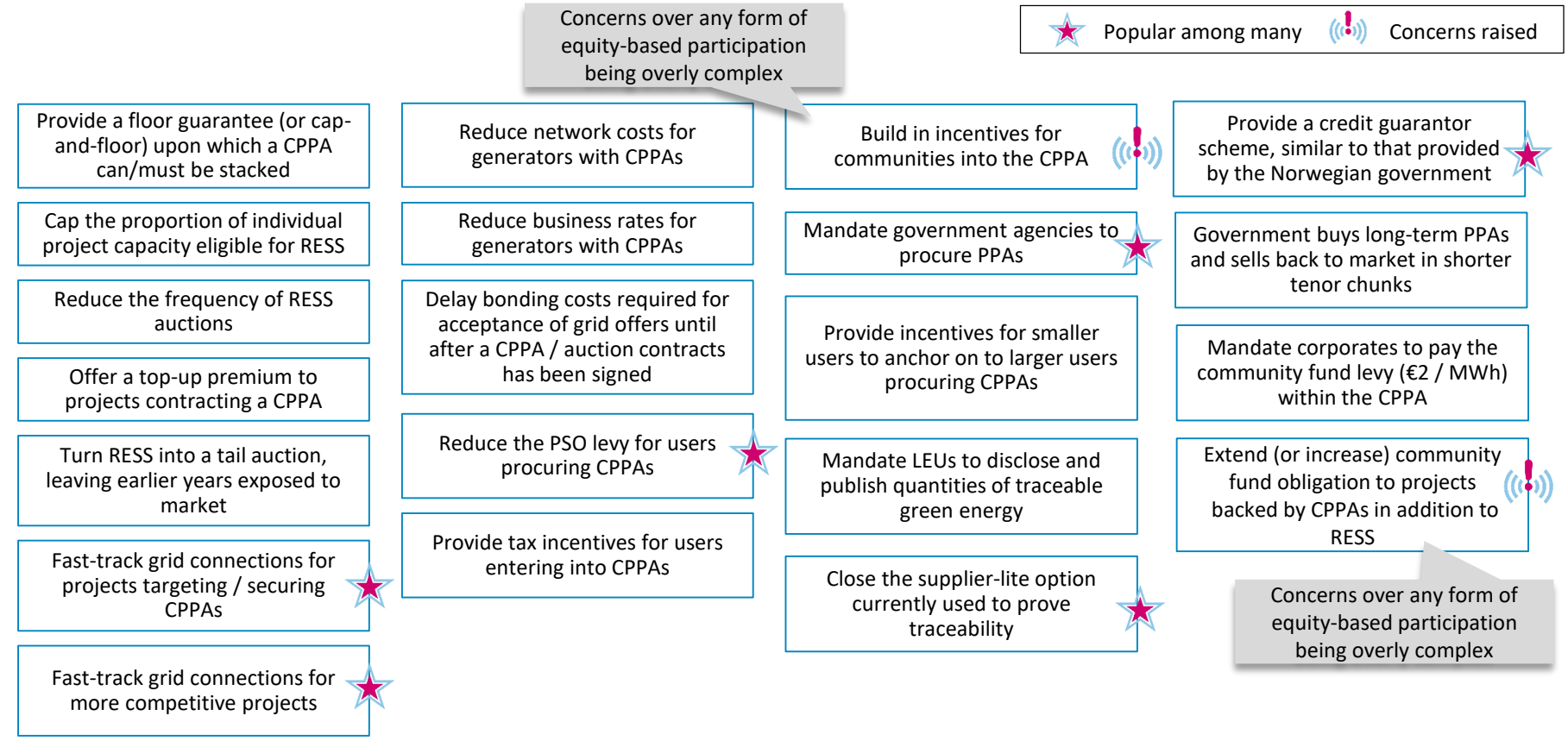
- Stakeholder engagement was a key part of this work, enabling input from developers, finance providers, legal advisors, insurance providers, data centres, other private large energy users, the public sector, suppliers/traders, system operators, regulators and Government. 24 organisations participated through one-to-one or small group sessions with Baringa, and 64 people attended an open workshop with Baringa and members of the steering group. The key findings were as follows.
- There is pent up demand for CPPAs among data centres and other LEUs with hard decarbonisation targets and experience of doing CPPAs in other markets. These corporates have experience pricing in the €30/MWh range in Europe, but *may* contract in the €50/MWh in SEM as this level approaches parity with wholesale prices.
- Some large, consented onshore wind projects can offer this in the near term without subsidies. There is a development pipeline of up to 500 MW of these, the majority of which is awaiting necessary consents.
- However, developers are holding out for RESS auctions, meaning almost none of these competitive projects are actively seeking CPPAs. There is a perception that the ECP grid offer program is "set up to serve the RESS auction cycle", and thus will compound the problem if not revised.
- Developers also face challenges in managing commercial risks associated with CPPAs that are not present in RESS contracts, in particular late delivery risk, whether caused internally or by external factors such as late connection delivery.
- There are broader challenges to bring down the LCOE of projects in Ireland that might increase the pool of competitive projects in the mid-longer term, including the lack of large spaces to build projects at scale, the level of uncertainty and delay in getting planning and consents, and 'rateable values' for business rates that are based on (high) legacy REFIT valuations.
- There are challenges to make CPPAs appeal beyond large multinational technology firms, namely:
  - Credit risk of smaller energy users.
  - Unwillingness to contract fixed-price for energy at 15 year tenors among users whose business cycle is shorter term (e.g., agri-food).
  - Limited current incentives for public bodies to prioritise decarbonisation targets over cost efficiencies.

Key stakeholder groups interviewed

- Developers
- Finance partners
- Legal advisors
- Insurance providers
- Data Centres
- Other private LEUs
- Public sector as a user
- Suppliers / traders
- Operators / regulators / Gov

Executive summary – Stakeholder ideas for interventions

The following policy interventions targeted at addressing barriers to CPPAs were suggested or commented upon by stakeholders



These were incorporated into the initial longlist of interventions evaluated in this report

Executive summary – Categories of intervention

We developed a 'longlist' of 54 interventions by first considering a number of target areas or 'categories' of intervention, then scored them against a set of criteria

- We developed a longlist of interventions to stimulate CPPAs by considering each of the categories shown in the figure on the right – based on our experience of other power markets, and on the stakeholder engagement we conducted.
- There is a group of interventions required to ensure a pipeline of high quality, competitive, renewable projects in Ireland. These will be critical not only to the success of the CPPA market, also to the RESS-supported renewables market:
  - Reducing development cost and timelines.
  - Providing a liquid wholesale electricity market with robust pricing, across a range of traded products and time horizons.
  - Ensuring the timely availability of grid connections.
  - Nurturing the flexibility, storage and system services that will support the integration of renewables.
- As these enablers are not specific to the CPPA market, we did not include them in the longlist of interventions considered in this report. Equally, we have excluded interventions which do not provide 'additionality' – for example, CPPAs where additionality has been primarily underpinned by another PPA or by REFIT / RESS schemes.
- We scored each longlisted intervention against a set of detailed scoring criteria – the high level categories of which are shown on the right.

Assessment scoring criteria

Efficacy in enabling CPPAs				Impact on DCCAE goals	Support from stakeholders	Complexity, uncertainty and execution risk
CPPA pipeline of available and interested projects	CPPA economics / price	CPPA commercial risks (credit, downside, tenor)	CPPA procurement (speed, cost of procurement, complexity)	Socialised cost, community involvement, tech diversity	Generators, LEUs, other business, citizens, suppliers	Market integration, parameter specification, cost/adoption uncertainty

Key intervention categories

Changes to future RESS auctions

- Changes to the structure and rules of the RESS auction that are aimed at ensuring both CPPA market and RESS auction have a healthy and competitive pipeline or projects. All other interventions except those in this category are appraised on the assumption that the RESS auction does not change

Other developer targeted interventions

- Interventions that specifically incentivise developers to seek CPPAs or other merchant routes to market (RtMs), either directly or implicit in other interventions

Market-making initiatives

- Interventions that facilitate the execution of CPPAs without targeting one stakeholder group e.g., through standardisation, risk socialisation, education and marketing

End-user targeted interventions

- Interventions that specifically incentivise large energy users to seek CPPAs or other merchant RtMs, either directly or implicit in other interventions

Supplier / trader targeted interventions

- Interventions that specifically incentivise energy traders and suppliers to seek long-term fixed-price offtake agreements from generators

Removing peripheral barriers

- Interventions that remove barriers that currently prevent CPPAs from occurring where both parties are sufficiently incentivised to do so e.g, community buy-in, physical/network and regulatory hurdles

Executive summary – Shortlisted interventions

21 of the policies longlisted appear to be feasible and worthy of further analysis on effectiveness, costs and benefits

Candidates recommended for further appraisal

- Interventions which score highly in the qualitative assessment, and have the potential to begin making a material contribution in the first half of the 2020s.
- Interventions which create a pipeline of competitive projects that need a CPPA to reach market.
- Interventions which make the pipeline of projects more competitive by improving market fundamentals i.e. lowering development costs without providing subsidies.

Focus	#	Intervention	Rationale for inclusion	CAP Action[1]
Auction	1	**Cap capacity eligible for RESS**	Creates supply	Action 28
	2	**RESS tail auction**	Creates supply, removes credit risk and price risk	Action 28
	3	**Leave price exposure in RESS (floor auction)**	Creates supply, removes price risk	Action 28
	4	**Reduce RESS auction frequency**	Creates supply	Action 28
	6	**Reduce RESS clearing volume**	Creates supply	Action 28
Developer	7	**Fast-track grid connection offers for otherwise ready projects**	Creates supply	Actions 17, 19, 23
	8	**Facilitate direct wire for CPPAs**	Creates demand	Action 22
	10	**Reduce business rates for CPPA projects**	Creates demand	*None*
	11	**Grid follows funding for CPPA projects**	Creates supply	Actions 17, 19, 23
End user / supplier	15	**Tax incentives for CPPAs**	Improves pricing	*None*
	16	**RESS PSO exemption for CPPAs**	Improves pricing	*None*
	18	**Close supplier-lite option**	Creates demand	*None*
	23	**Mandate GoO / fuel mix disclosure among LEUs**	Creates demand	*None*
	24	**Mandate private demand for unsubsidised green power**	Creates demand	Actions 20, 37
	25	**Mandate CPPAs among LEUs**	Creates demand	Actions 20, 37
	26	**Mandate suppliers to procure unsubsidised renewables**	Creates demand	*None*
	27	**Mandate public demand for unsubsidised green power**	Creates demand	*None*
Market making	32	**Price floor guarantee on CPPAs**	Improves pricing, removes price risk	Action 28
	35	**3rd party default guarantee**	Removes credit risk	*None*
Peripheral	36	**Extend community fund to CPPAs**	Builds community support	*None*
	37	**Mandate community principles for merchant projects**	Builds community support	*None*
	38	**Mandate community fund payment for CPPA projects**	Builds community support	*None*

[1] *Interventions that map to existing Climate Action Plan actions*

Executive summary – Relative cost of interventions

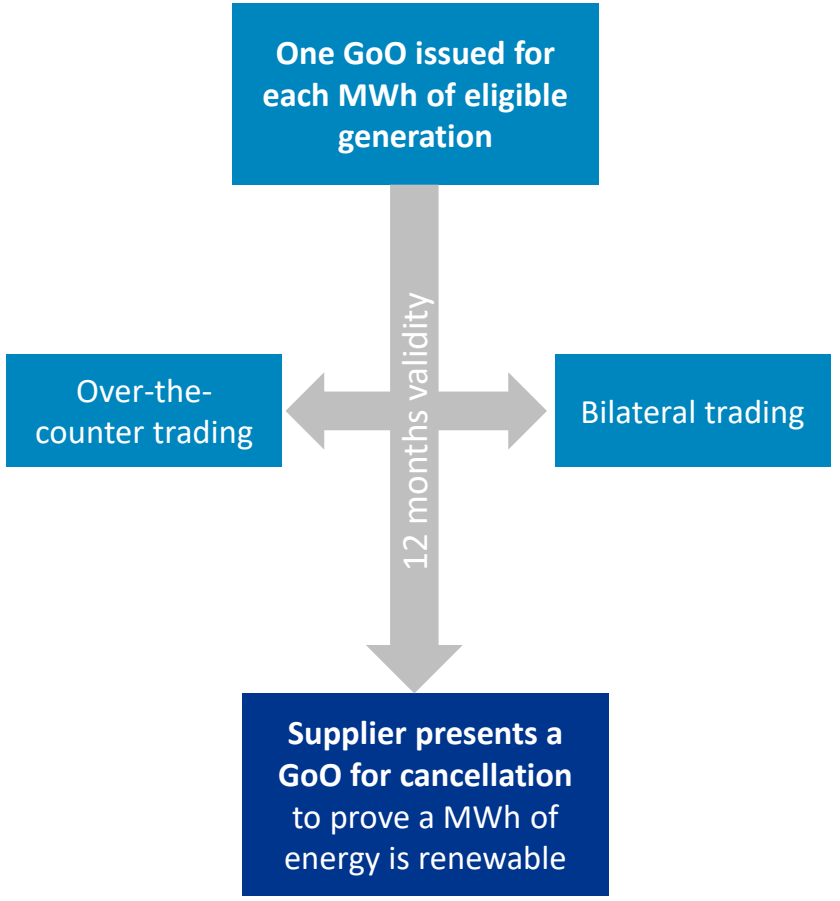
Some interventions are easily achievable through current mechanism, others require primary legislation and/or more development to assess feasibility

		Cost		
#	**Intervention**	**To industry**	**To public / consumers**	**To design / implement**
1	Cap capacity eligible for RESS	Disruptive – may increase cost	Carries risk of higher auction prices	Complex to design
2	RESS tail auction	Disruptive – may increase cost	Carries risk of higher auction prices	Complex to design
3	Leave price exposure in RESS (floor auction)	Disruptive – may increase cost	Carries risk of higher auction prices	Further design / analysis required
4	Reduce RESS auction frequency	Disruptive – may increase cost	May increase cost of RESS	Relatively simple
6	Reduce RESS clearing volume	Disruptive – may increase cost	May increase cost of RESS	Relatively simple
7	Fast-track grid connection offers for otherwise ready projects	Cost reducing to developer	May increase cost of RESS	Further design / analysis required
8	Facilitate direct wire for CPPAs	Cost reducing to developer	High uncertainty over cost required	Further design / analysis required
10	Reduce business rates for CPPA projects	Cost reducing to developer	Requires redistribution of tax base	Further design / analysis required
11	Grid follows funding for CPPA projects	Cost reducing to developer	May increase network costs	Complex to design
15	Tax incentives for CPPAs	Cost reducing to LEU	Requires redistribution of tax base	Further design / analysis required
16	RESS-specific PSO exemption for CPPAs	Cost reducing to LEU	Significant if power prices decline	Relatively simple
18	Close supplier-lite option	Modest additional cost on LEU	No additional cost to consumers	Relatively simple
23	Mandate GoO / enhanced fuel mix disclosure among LEUs	Modest additional cost on LEU	No additional cost to consumers	Relatively simple
24	Mandate LEUs to procure GoOs from Irish merchant RE	Cost additive to LEU	No additional cost to consumers	Further design / analysis required
25	Mandate LEUs to procure CPPAs from Irish RE	Cost additive to LEU	No additional cost to consumers	Complex to design
26	Mandate public sector to procure CPPAs from Irish RE	Neutral	Cost additive to public sector energy costs	Further design / analysis required
27	Mandate suppliers to procure GoOs from Irish merchant RE	Cost additive to LEU	No additional cost to consumers	Further design / analysis required
32	Offer price floor guarantee on CPPAs	Cost reducing, shared	May be costly depending on uptake	Complex to design
35	Offer 3rd party default guarantee on CPPAs	Cost reducing, shared	Should be material but not exposed to power price movements	Complex to design
36	Govt. provides community fund for CPPA projects	Cost reducing, shared	Significant, guaranteed cost	Relatively simple
37	Mandate community principles for merchant projects	Neutral	No additional cost to consumers	Relatively simple
38	Mandate CPPA projects to provide community fund	Cost additive, shared	No additional cost to consumers	Relatively simple

Executive summary – Guarantees of Origin

All EU Member States must maintain a Guarantee of Origin scheme – the sole intended purpose of which is to enable electricity which is being sold / purchased to be certified as renewable

- All EU Member States are required to maintain a Guarantees of Origin (GoO / REGO) scheme which enables energy to be certified from renewable sources.
- The sole intended purpose is to enable producers, traders and suppliers to certify that electricity which is being sold / purchased is renewable:
  - GoOs do not play a role in measuring the compliance of Member States with renewable targets
  - One GoO is issued for each MWh of eligible renewable energy, and GoOs are valid for one year from the date of generation. In Ireland SEMO is the body that issues GOs to eligible generators.
  - A supplier, or end consumer, must present a GoO for cancellation to prove that a MWh of energy is from renewable sources.
- The relevant EU Directive (2001/77/EC) established only the broad requirement for a GoO scheme – and so the exact implementation differs between Member States.
- Any genuine GoO issued by a Member State must be recognised by any other Member State that has implemented the Directive. There is no connection between GoOs and physical energy – the two can be traded separately. The Association of Issuing Bodies (AIB) operates a hub where GoOs can be traded between countries.
- GoOs are the main route by which corporates and large energy users prove the traceability and green attributes of renewable power contracted under a corporate PPA. For this reason, corporates almost always require the GoOs from a renewable generator to flow to them under a corporate PPA. Although corporate offtakers usually obtain their power from the national grid, which is not 100% renewable, under the GHG Protocol market-based method this can be reported as zero carbon if enough GoOs are obtained to cover their demand.



Executive summary – Fuel mix reporting in Ireland

Fuel mix disclosure is currently reported as a single figure per licensed supplier – more transparent reporting for large energy users may provide a greater incentive to contract with Irish renewables

- GoOs are used by licensed electricity suppliers in their Fuel Mix Disclosure (FMD), which is published annually by CRU. The FMD is for a supplier's entire customer base rather than on an individual customer basis. The FMD therefore represents a supplier's average fuel mix and not that of a specific product that the supplier is selling, or a specific end consumer.
- Since GoOs can be traded cross border, separate from the physical power, the renewable attributes claimed in the FMD do not necessarily represent metered generation located in Ireland. For example, there was a net import of GoOs to Ireland equivalent to 8.8 TWh of renewable generation in 2018. These GoOs were imported from Norway and the UK. This means that the renewable share of the total supplier FMD significantly exceeds the renewable share of the actual All-Island generation mix.
- The current FMD, an example of which is shown on the right, makes no distinction between renewable power which is sourced from Irish renewables, versus imported GoOs. Neither does it distinguish between renewables which are supported under the PSO, and those which are not in receipt of support.
- In Ireland, renewable producers which are in receipt of Public Service Obligation (PSO) support, such as REFIT or the new RESS scheme, are not eligible to receive GoOs. PSO-supported generation must be allocated evenly across all customers for the purposes of fuel mix disclosure. This regulation reduces the flexibility of suppliers to back green source offerings with REFIT-supported production. One work-around for this is to establish a new licensed supplier (or 'supplier-lite') entity, which contracts only with PSO-supported generation, and to supply the end customer from this entity.
- An 'enhanced' fuel mix disclosure could involve mandatory reporting for large energy users and corporates, separate reporting of domestically-generated and imported GoOs, and a clear distinction between renewables which are supported by the PSO and those which are not. This may enhance the incentive for corporates to contract directly with unsubsidized Irish renewables.

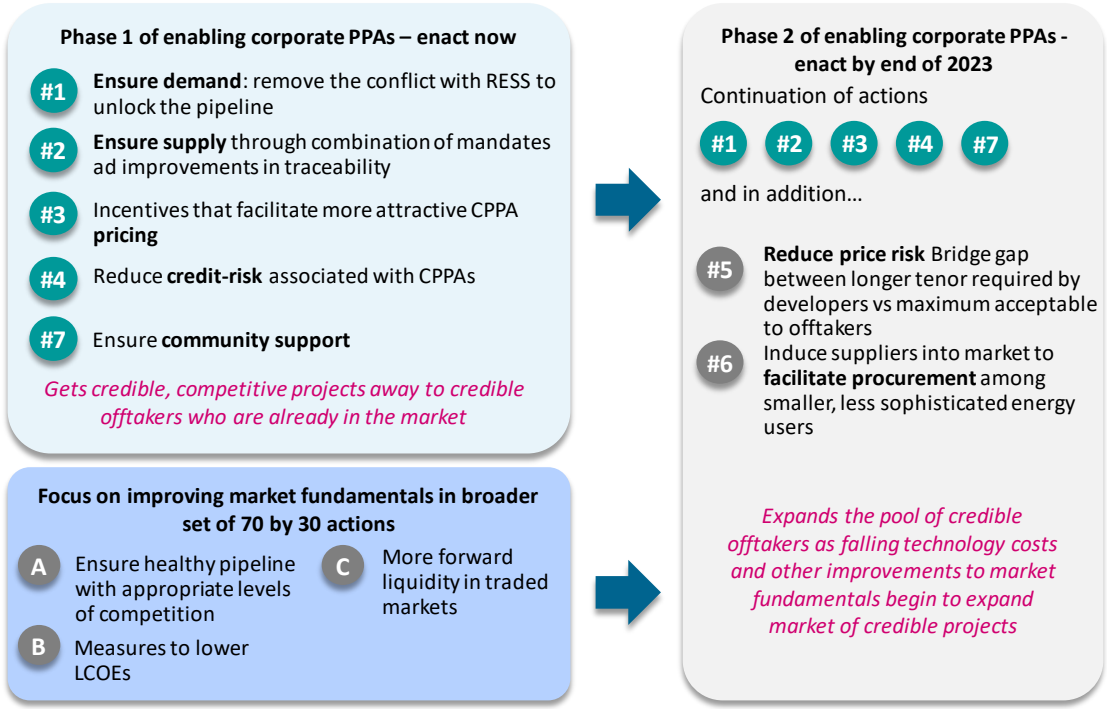
Extract from CRU fuel mix disclosure for 2018

Supplier	Coal	Gas	Peat	Renewable	Other	Total	tCO2 /MWh
All Island Fuel Mix	6.8%	38.5%	4.6%	48.9%	1.2%	100.0%	0.291
Bord Gáis Energy	2.5%	62.2%	1.7%	33.2%	0.4%	100.0%	0.322
electric Ireland	5.9%	51.3%	4.0%	37.7%	1.0%	100.0%	0.333
energia	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
just energy	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
Go Power	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
Panda Power	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
sse Airtricity	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
Naturgy	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0
PINERGY	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0

Executive summary – Actions required for CPPA activity

We believe there are steps to unlocking CPPAs among data centres immediately, and steps to broaden the base of demand beyond those centres in a potential 'second phase'

- Based on our four features of a healthy CPPA market, we developed seven actions we believe are required to deliver CPPA goals in Ireland. We then considered the timing of CPPA deployment through to 2030 in terms of demand and supply-side readiness.
  - On the demand side, projected data centre (DC) energy requirements alone are in excess of the 15% CPPA target by 2030, but over-reliance on DCs carries risk and should be avoided. DCs are the 'low-hanging fruit' that can be pursued first, but CPPA reforms to unlock broader large energy user base should be pursued to leverage the full corporate demand for green energy.
  - On the supply side, larger onshore wind projects are more 'primed' for CPPAs than other technologies as they are currently more cost competitive. However, it is not clear that there is sufficient pipeline in onshore wind to meet the required deployment, once build under RESS has been accounted for. Offshore wind and solar may become more competitive later in the 2020s, leading to more deployment in the latter half of the window.
- We propose a 'Phase 1' of interventions targeted at getting credible, competitive renewable projects signed up with credible offtakers already active in the market. A 'Phase 2' could then expand the pool of credible offtakers, and take advantage of falling technology costs.

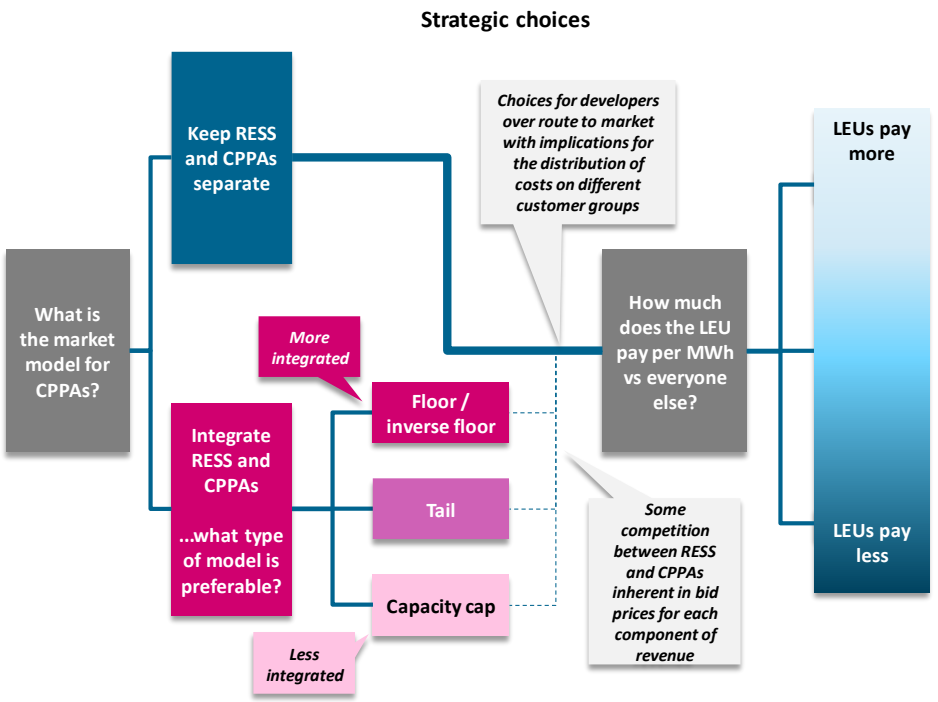


A full mapping of each shortlisted intervention against the seven enabling actions can be found in Section 6.

Executive summary – Strategic decisions

There will be some key, strategic, and unavoidable choices to face in designing an effective CPPA policy package

- We believe that there will be two key strategic decisions to be made when constructing a CPPA policy package. We have mapped these strategic choices in the framework shown to the right.
- First, the government has a choice between keeping RESS and CPPA separate or integrating them such that projects may consider multiple routes to market.
  - Keeping RESS and CPPAs separate requires little change to the current market design. Separation limits the size / scope of RESS, and leads to clearer additionality for CPPAs. However, there will always be competition between the CPPA and RESS markets and a tension between their relative attractiveness to developers. Policy will determine where the best projects go. Integrating RESS and CPPA markets avoids the problem of competition between the two. However, it requires a deliberate change in future RESS market design, which would need to be carefully chosen to retain sufficient additionality attributes for the corporate.
  - Options for 'revenue stacking' models that would integrate CPPA and RESS markets include (i) tail auctions (ii) price floor on the RESS reference price, and (iii) cap on proportion of project capacity that can be supported.
  - The first strategic decision point was pre-RESS 1, whether or not this was actively decided. There is the potential to shift position in the medium-term for RESS 2, RESS 3 etc.
- Second, there is a decision on how much Large Energy Users (LEUs) pay proportionally per MWh versus other end consumers. Many of the possible interventions result in changing this balance – it is therefore important to make a conscious and informed decision about this trade-off.
- It is important to note that doing nothing, or maintaining the status quo, is itself a policy decision.



A mapping of each shortlisted intervention against these two strategic decisions can be found in Section 6.

Executive summary – Should RESS be separate or integrated?

Government has a choice between keeping RESS and CPPA separate or integrating them such that projects could combine multiple routes to market

Should RESS be separate or integrated?

Separate

Implications

- ✚ Requires very little change to current market design
- ✚ Keeps RESS limited in size**, reducing operational risk on DECC** in facilitating deployment
- ✚ **Clearer additionality** associated with CPPAs
- ▬ There will **always be tension / competition between RESS and the CPPA** market,
  - Relative to an integrated model, **this forces a more explicit policy choice** on whether CPPA offtakers should pay more or less than the broader PSO base as policy determines where the 'best' projects go
- ▬ May require **change of law for offshore wind** projects to go ahead with CPPAs without participation in RESS as currently RESS participation is mandated in leasing/consenting process

Key policy options

- ▲ Reduce RESS auction frequency
- ▲ Reduce RESS auction clearing volume
- ▲ Make connection offers for CPPA projects further ahead of RESS

Integrated

Implications

- ▬ Requires a deliberate change in market design
- ✚ Broadens merchant-exposure beyond CPPAs, **allowing more flexibility in optimising the correct model for taking on merchant exposure** within each project.
- ✚ Potential for some models to **address credit and price risk barriers**
- ✚ Can (in some models) **stimulate more liquidity in traded forward markets**, improving operation of SEM
- ▬ Places most or all of the volume required for '70 by 30' into RESS – **more operational risk on DECC** in facilitating deployment
- ▬ CPPAs may be **challenging to close until post-auction**, may slow down time to reach financial close in some cases
- ▬ Unclear whether CPPAs stacked on government contracts **are sufficiently additional** for corporates
- ▬ **Risk of inflated RESS prices** if CPPAs cannot be procured prior to financial close

Key policy options

- ▲ Change RESS design to allow potential 'stacking' of CPPA and RESS revenues

✚ Pro ▬ Con

These are either / or choices – the continuation of current RESS design equates to keeping markets separate

Executive summary – What do LEUs pay proportionally?

Many interventions change how much LEUs pay proportionally per MWh of renewable power vs other consumers – it is important to make a conscious and informed decision about this trade-off

Do LEUs pay more or less than everyone else?

Target model of LEUs paying more

Implications

- ✚ Makes mandating demand feasible and therefore **de-risks** likelihood of **targets not being met**
- ✚ **Reduces overall burden of PSO** by reducing levy attributable to RESS, thereby reducing risk of loss of public support for 2030 targets
- ▬ Increases risk that mandated CPPAs are purchased above wholesale prices. This in turn may cause:
  - Reduce Ireland's **attractiveness to foreign direct investment** in energy intensive sectors
  - Increase the **likelihood of LEUs pursuing legal options** in any mandate rather than accepting it

Key policy options

- ▲ Mandate CPPAs among LEUs
- ▲ Mandate minimum quantity of GoOs among LEUs
- ▲ Provide incentives to LEUs that help achieve better pricing (tax, PSO, business rates)

Target model of LEUs paying less

Implications

- ▭ Implies avoiding interventions aimed at offering **price incentives** or **mandates on CPPA procurement** to be introduced, as these will artificially increase prices
- ▭ Implies a focus on **risk-reducing incentives** aimed at facilitating CPPAs, but which may require further cost socialisation (on PSO or LEUs) as these will reduce prices by warehousing risk
- ✚ **Leverages existing demand** among LEUs for CPPAs with projects that are i) comparable or below with wholesale prices and that ii) otherwise **might achieve infra-marginal rent** in RESS
- ▬ Risk of **reducing public support** for both 2030 targets and for large energy users if they are perceived to be benefiting from policy

Key policy options

- ▲ Fast-track consent of more competitive projects, increasing time-lag to RESS
- ▲ Warehouse price risk and credit risk away from individual CPPA contracts

▭ Neutral ✚ Pro ▬ Con

These represent two extremes of a spectrum and government could attempt to pursue a hybrid approach by mixing mandates and incentives

Executive summary – Linking interventions

There are linkages between many of the shortlisted interventions – these can either be additive, complimentary, cannibalistic or mutually excusive

- In constructing a coherent and effective package of interventions, it will be important to consider the linkages and interactions between individual measures.
- There are broadly four types of interaction as shown in the table to the right.
- We have undertaken an assessment of each of the shortlisted interventions and have mapped the linkages between each. This resource can then be used to weigh the combinations of interventions.

Classification of relationship	Description	Example
A - Additive	Each has same effect but do not cannibalise each other	*PSO exemption + Business rates reduction*
C - Complimentary	Each addresses different issues	*Mandate CPPA procurement + PSO exemption*
X - Cannibalistic	Each combined somewhat reduces the efficacy of the other due to overlapping objectives which are not additive	*PSO exemption + Community Fund contribution*
E/I - Either / or	Avoid combining both, each radically reduces the case for the other	*RESS Tail auction + RESS Floor auction*

A full mapping of the linkages between each shortlisted intervention can be found in Section 6.

Executive summary – Example Package 1 | Segregated markets, enhanced LEU access to pipeline

Segragate markets, enhanced LEU access to pipeline	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
Fast-track connection offers for more otherwise ready projects		✓						Core
Reduce RESS auction frequency	✓							Core
Close the supplier-lite option		✓						Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Mandate community principles for merchant projects							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
3rd party acts as guarantor in case of default		✓		✓				Optional
Mandate public sector demand		✓						Optional
Floor guarantee on CPPAs					✓	✓		Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- Interventions which create a time lag for more competitive projects between being shovel ready and RESS
- Enhanced GoO / fuel mix disclosure publication and closure of supplier-lite option to encourage LEUs who are slow to pursue projects

Potential variations

- PSO rebate and / or mandate to procure can be introduced if price marginally prohibitive
- Public sector mandate or a floor guarantee can plug any demand gap that is foreseeable if data centre LEU market is exhausted
- Credit guarantee may increase size of data centre market beyond global tech giants to more specialist players

Technology and timing perspective

- Will work immediately for onshore wind if acted upon in time for ECP2
- May require cost to fall for solar before being effective
- Not appropriate for offshore wind due to requirement to auction offshore wind capacity and farms requiring multiple CPPAs to fill capacity

Executive summary – Example Package 2 | Segregated market, mandate driven approach

Segregate markets, LEUs pay more	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
Mandate LEUs to procure GoOs or CPPAs from Irish merchant RE		✓						Core
Reduce RESS frequency and / or clearing volume	✓		✓					Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
3rd party default guarantee on CPPAs				✓				Optional
Floor guarantee on CPPAs					✓	✓		Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- Mandate that ensures demand, combines with some control over RESS timings and volumes to ensure adequate supply (but without a focus on steering most competitive projects towards CPPAs)
- Closure of supplier-lite option reduces risk of loop-holing mandate
- LEUs pay for community fund

Potential variations

- Incentives can be introduced if CPPA prices become too inflated
- Credit and price risk guarantees can be introduced if mandate is to be extended beyond data centres

Technology and timing perspective

- May be most effective option where costs do not fall fast enough in line with wholesale prices e.g., solar
- Equally may be more desirable where costs are consistently below wholesale prices (e.g., Baringa High Commodities scenario) and LEUs therefore still getting value despite paying more than RESS

Executive summary – Example Package 3 | Tail auction

Tail auction	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
RESS tail auction	✓	✓	✓	✓	✓	✓		Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
Mandate suppliers or LEUs to procure GoOs from Irish merchant RE		✓						Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- A RESS auction which leaves the first 5 years uncontracted for the market to fill in
- Enhanced GoO publication / fuel mix disclosure, and closure of supplier-lite option, to encourage LEUs who are slow to pursue projects

Potential variations

- Mandate on suppliers or LEUs to procure if lack of demand is preventing projects taking off even with RESS contracts

Technology and timing perspective

- May provide a means of offshore wind securing CPPAs while still going through RESS
- Also workable for onshore wind and solar
- May be more appropriate for RESS 3 – 4: lack of precedent presents risk, may benefit from further design taking into account
  - RESS 1 learnings
  - evolution of CPPA market over next 2 – 3 years learnings –

Executive summary – Example Package 4 | Floor auction

Floor auction	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
RESS floor auction	✓	✓	✓		✓			Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
Mandate suppliers or LEUs to procure GoOs from Irish merchant RE		✓						Optional
3rd party acts as guarantor in case of default		✓		✓				Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- A RESS auction which provides a price floor as a 'backstop' but leaves generators exposed to market price risk above this level
- Enhanced GoO publication / fuel mix disclosure, and closure of supplier-lite option, to encourage LEUs who are slow to pursue projects

Potential variations

- Mandate on suppliers or LEUs to procure if lack of demand is preventing projects taking off even with RESS contracts
- Default guarantee may be introduced if credit risk is still proving to be a barrier

Technology and timing perspective

- May provide a means of offshore wind securing CPPAs while still going through RESS
- Also workable for onshore wind and solar
- May be more appropriate for RESS 2 or beyond: may benefit from further design taking into account
  - RESS 1 learnings
  - Further study of the Netherlands model

Contents

Introduction to Baringa

Baringa was started by a group of friends 20 years ago to provide a radically different consulting experience for clients and consultants.

What we do may sound familiar, but the experience will be uniquely different. We call it **Brighter Together**.

We are determined that our clients have a radically different experience when working with Baringa

- ✓ We are an independent partnership with a single P&L and long term, sustainable, growth plan
- ✓ We have built a model where senior delivery experience is hands-on in every client engagement
- ✓ We have an award winning culture that attracts the brightest people – achieving double digit growth in parallel to Great Place To Work for the last decade
- ✓ Collaboration runs through everything we do
- ✓ We genuinely partner with our clients, deploying smaller and more senior teams, with core industry experience and specialism
- ✓ Proven assets accelerate our clients' strategy, with methods being flexible rather than dogmatic, understanding problems and delivering bespoke, innovative, solutions

Our Model

1 Partner : 10 Employees

20+ Business Practices
We are experts in our chosen fields and have deep industry knowledge and capability

5 Offices Worldwide
660+ employees and 65 partners across the UK, USA, Germany, UAE and Australia

For Our Consultants

Great Place To Work
Voted top 10 'Great Places to Work' for 12 years running…this creates a highly motivated, engaged and passionate consulting team

Employee Engagement
Our employee Net Promoter Score is the highest in the Consulting Industry, and it's in the top 5% of all businesses worldwide!

Talent Magnet
As a result, we can attract, develop and retain the most talented consultants

For Our Clients

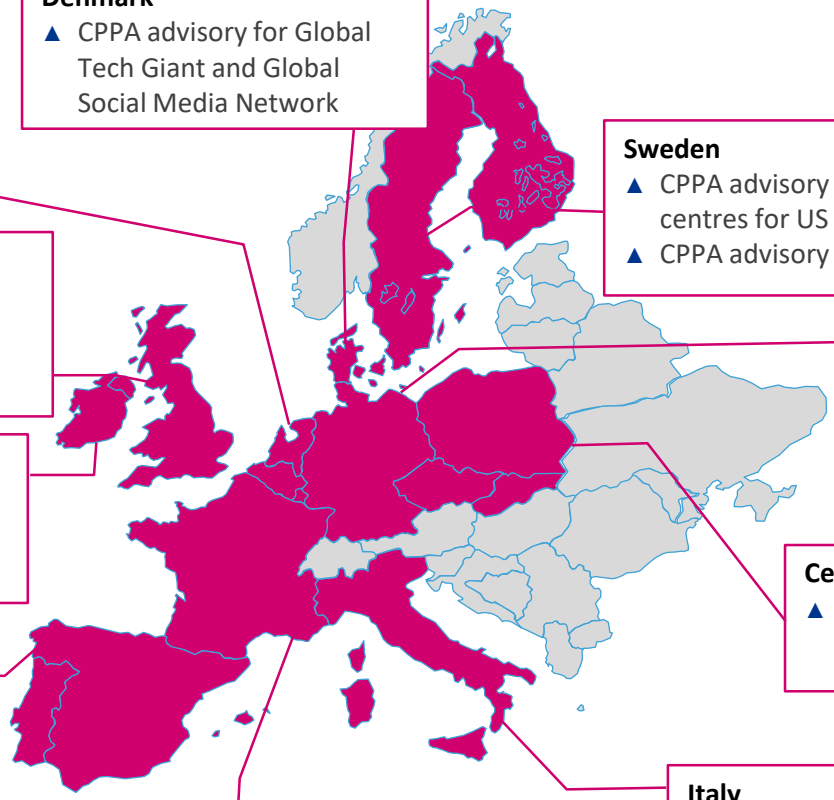
Reputation Built On Results
Our results speak for themselves, over 80% of our work is referral, recommendation and repeat business

Client Engagement
Our net promoter score from clients is in the top 5% across industry

Unique Experience
Our clients tell us that they enjoy the distinctive experience of partnering with Baringa

Where we've worked on PPAs

We've advised on energy procurement for large energy users across Europe and have worked with project developers and financiers on bankable routes to market



Denmark
- ▲ CPPA advisory for Global Tech Giant and Global Social Media Network

Benelux
- ▲ Curve provider for Belgian data centre CPPA
- ▲ Due diligence on offshore wind PPAs for Dutch utility

Sweden
- ▲ CPPA advisory on portfolio of data centres for US Tech Major
- ▲ CPPA advisory for major hydro utility

Great Britain
- ▲ CPPA procurement for leading supermarket retailer
- ▲ Offshore wind PPA for developer
- ▲ CCGT route-to-market PPA

Germany
- ▲ Curve provider to US Tech Major for CPPAs

Ireland
- ▲ Sell side advisory PPA procurement
- ▲ Buy side curve provider for data centres for multiple US Tech Majors

Central and Eastern Europe
- ▲ PPA procurement for major supermarket retailer

Iberia
- ▲ Lead market advisor on CPPA for global sports brand

Italy
- ▲ Framework agreement in progress between developer and user for > 200 MW of solar

Egypt
- ▲ PPA strategy and procurement for global telecoms

France
- ▲ Advised global retail brand on market attractiveness for PPAs

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Background and policy context

SEAI is seeking to understand how policy can be designed to maximise the contribution that corporate PPAs can make to delivering Ireland's ambitious renewable electricity targets

- The Government has set a target of achieving a renewable share of electricity consumption of 70% by 2030 as part of its Climate Action Plan released in Summer 2019.
- The Government aims to achieve this target primarily through two avenues:
  - A new Renewable Electricity Support Scheme (RESS) to support penetration of renewables up to 55%. The previous REFiT scheme closes to new commissioning projects on 31 December 2019. Projects already commissioned under REFiT will receive support to the end of the 15 year contract term. The first RESS auction will take place in June 2020, with first delivery of projects under the scheme expected by December 2022. Both schemes are funded by end consumers through the Public Service Obligation (PSO) levy.
  - The facilitation of Corporate Power Purchase agreements (CPPAs) and other market instruments that allow new renewable projects to be developed without (or with reduced) support from the PSO.
- SEAI has engaged Baringa to develop a shortlist of policy options for consideration by government aimed at improving the market environment for corporate PPAs in the Irish Single Electricity Market.

Rationale for CPPA policy intervention

Reasons why CPPAs are part of the 70 by 30 roadmap

- **Lowering the PSO burden**: Many corporate energy users place a premium on sourcing green energy. This can be leveraged as a means of lowering the overall PSO burden on end consumers by limiting the volume of renewable energy which must be sourced via the RESS auctions or the REFIT scheme.

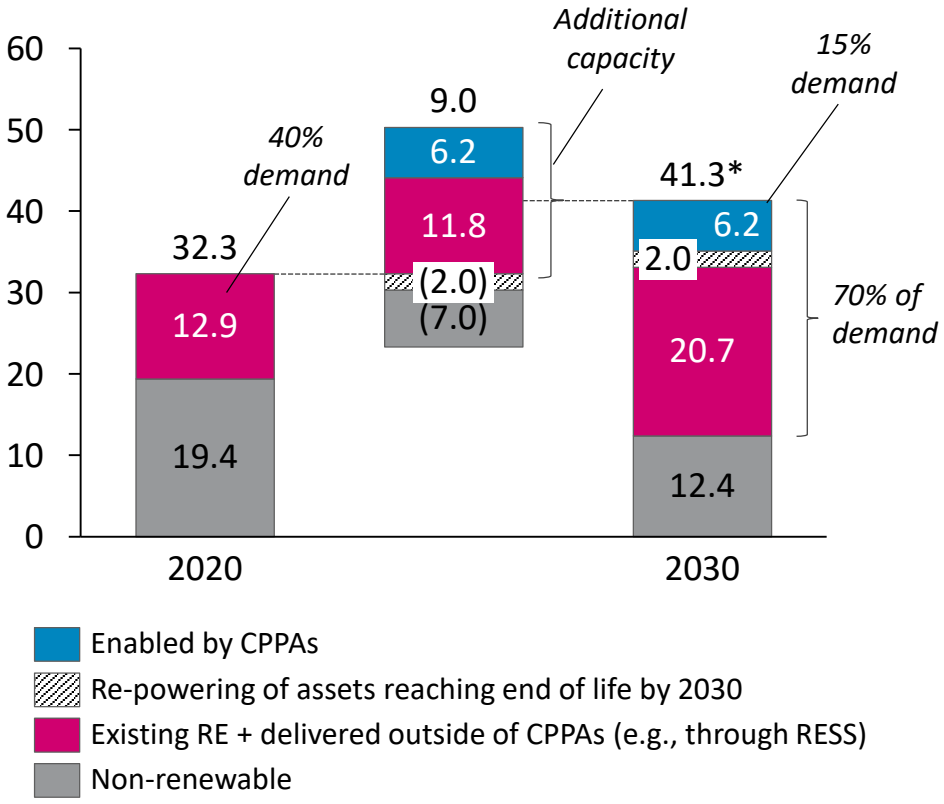
- **Ensuring larger corporations play their part**: Ireland is expected to see considerable growth in energy demand from energy intensive technology corporations over the coming decade, making the 70 by 30 target all the more challenging. Their visible contribution to reaching the 70 by 30 target is therefore crucial to their long-term acceptance among the public as responsible organisations in the energy transition.

- **Transitioning from state-led to market-led solutions**: If new projects can deliver at or below the price of wholesale electricity, then effort should be made to facilitate a market-led route-to-market which does not rely on state support. This lowers the burden of action placed on the state in the long-term and, in theory, increases the efficiency of the market by reducing constraints placed on it by reliance on auctions.

What corporate PPA policy is trying to achieve

‘15% of demand’ implies that 6 TWh of additional electricity generation by 2030 is underpinned by CPPAs – this is c.35% of all new generation capacity

RoI renewable electricity penetration targets between end of REFIT and 2030
TWh electricity demand



- As of the end of 2019, renewable energy capacity in the Republic of Ireland will have reached 4.4. GW, capable of supplying approximately 13 TWh of demand (40% of total RoI demand).
- Eirgrid estimates that demand will grow from 32 TWh per annum in 2020 to approximately 41 TWh of demand by 2030, primarily driven by expansion of data centres and other large energy users.
- As a result, in order to meet the 15% CPPA target, approximately 6 TWh per annum will need to be underpinned by corporate PPAs
- A further 12 TWh per annum will need to be delivered through other means, primarily RESS
  - Within this, approximately 2 TWh will be delivered as a result of replacing or repowering existing capacity
  - At present there is no policy preference on mode of delivery for repowering and Government may opt to either increase the CPPA target or RESS volumes accordingly

Note: *2028 estimated demand assumed as proxy for 2030 demand
Source: Eirgrid GCS 2019, Eirgrid TES 2019, DECC CAP

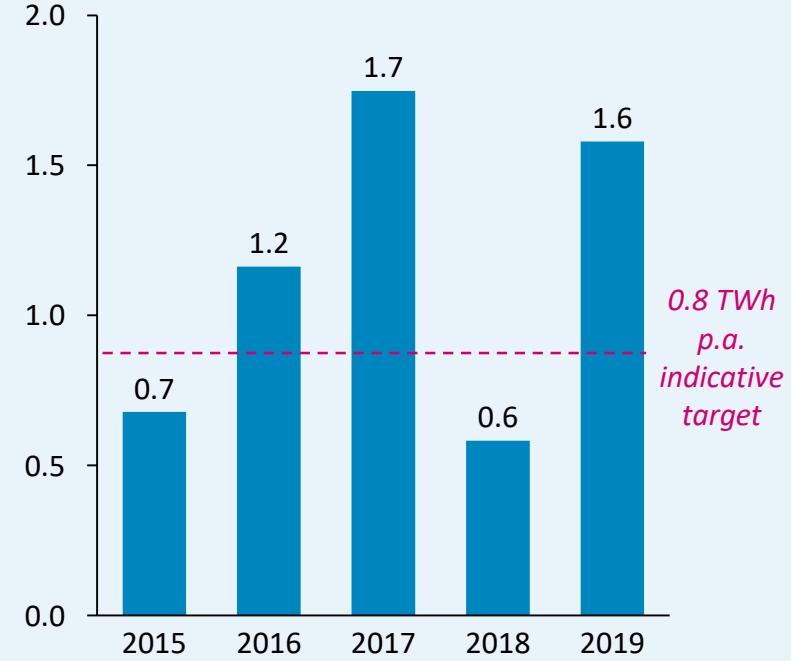
Size of ask versus historical deployment

‘15% of demand’ implies that 6 TWh of additional electricity generation, which would average c.800 GWh p.a. over the next 8 years, on par with historical deployment through REFiT

Indicative GW capacity required under CPPAs <u>if all done through one technology</u>

Technology	TWh	TWh p.a.	Typical load factor	Capacity required to deliver through one technology
Onshore wind	6.2	**0.8**	30%	6.2 TWh = 2.3 GW
Offshore wind	6.2	**0.8**	45%	6.2 TWh = 1.6 GW
Solar	6.2	**0.8**	11%	6.2 TWh = 6.4 GW

Historical deployment of onshore wind in RoI (2015 – 19)
TWh supply p.a. added that year



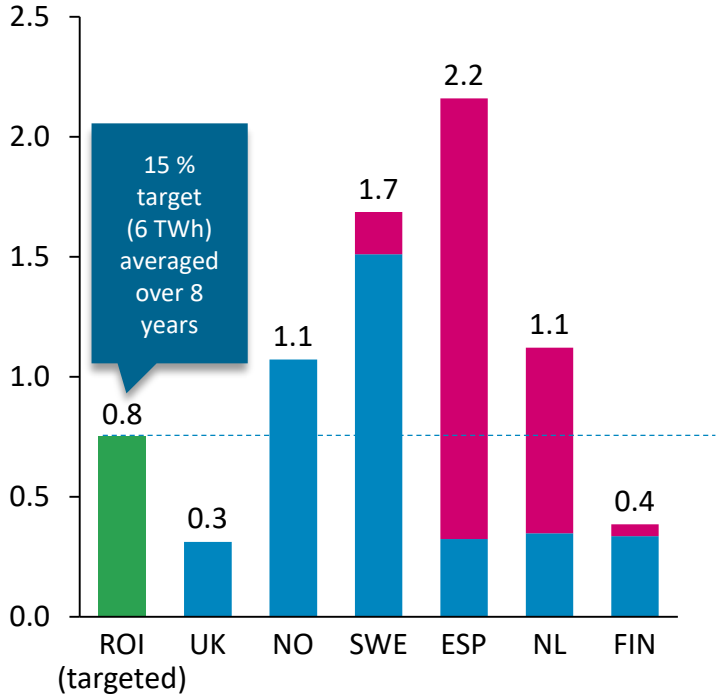
Note: *2028 estimated demand assumed as proxy for 2030 demand
Source: Eirgrid GCS, Eirgrid TES 2019, DECC CAP

Size of ask versus historical deployment

‘15% of demand’ implies a more central role for corporate PPAs in renewable build out than has been achieved to date elsewhere

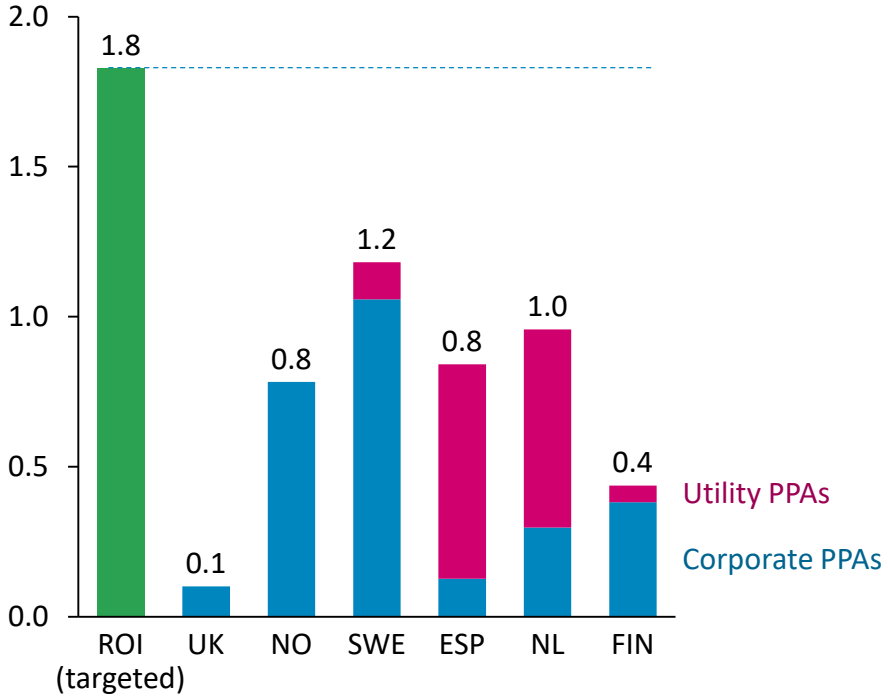
Other markets have achieved similar deployment levels of corporate PPAs in the last few years….

Average volume contracted* under PPA each year
(2017-19)
TWh



….However, once size of market is taken into account, the target suggests a more central role for corporate PPAs in Ireland than has been achieved to date elsewhere

Average volume newly contracted under PPA each year
(2017-19)
% of country annual demand^



Note: * Where only contracted capacity is reported, annual volumes estimated by applying a standard load factor assumption by technology and geography to each Corporate PPA deal. PPAs not aimed at fixing price and those between aggregators and suppliers have been excluded; ^Baringa Reference Case estimate for 2020 demand used for other geographies
Source: Baringa research, Baringa Reference Case, Eirgrid GCS

DECC objectives affecting policy choice

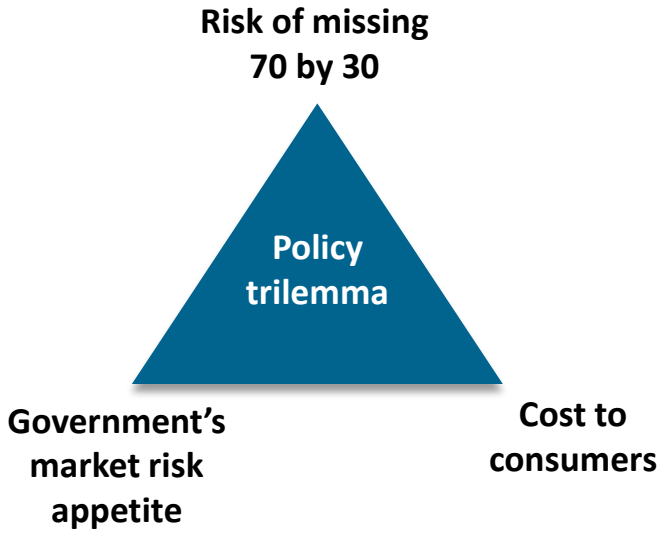
As well as renewable penetration and socialised cost, technology diversity and community engagement are explicit DECC aims

Renewable electricity 2030 targets

- The Government has set a target of achieving a renewable share of electricity consumption of 70% by 2030 as part of its Climate Action Plan released in 2019. Policy should **minimise risk of reaching 70 by 30** will be met within the boundaries of Government's appetite for **market risk** (how much market risk can it won through RESS contracts)

Effective competitive framework for delivery

- Any **cost to consumers** associated with delivering renewable energy (RE) targets needs to be minimised and distributed in a way that is deemed fair and acceptable by society



Increasing renewable technology diversity

- The 70% target is reached using a plurality of technologies rather than a single technology, thereby improving grid stability, reducing reliance on onshore wind, and allowing solar and offshore wind to grow as their LCOEs become more competitive

Increasing community participation and ownership

- New RE projects have the support of the communities that they impact upon

Source: DECC

Scope of outcomes considered in this report

Interventions are limited to those which promote new generation capacity outside of RESS, which includes, but is not limited to, a PPA between a generator and an end-user

In scope

- **Additionality-enabling Corporate PPAs** - PPAs which lower the cost of capital for new projects and therefore underpin final investment decision on new RE projects
- **Additionality-enabling traditional PPAs** – PPAs between generators and suppliers/utilities which lower the cost of capital for new projects and therefore underpin final investment decision on new RE projects
- **Enabling merchant risk:** Policies which allow new projects or developments to reach financial close with a higher degree of exposure to floating market prices

Not in scope

- **Policies** aimed at reducing the cost of funding RESS scheme **but which don't enable merchant risk** or **don't facilitate additionality-enabling PPAs**
- **Corporate PPAs which do not enable additionality** e.g., where additionality has been primarily underpinned by another PPA or by REFiT / RESS

For clarity, we will group both of these under 'CPPAs' in the stakeholder feedback and analysis that this report discloses

The role of repowering projects in meeting policy targets is not currently defined

- We estimate that approximately 800 MW of wind capacity will reach end of life between now and 2030
- The repowering / replacement of this capacity through RESS auctions requires a 50% increase in project capacity
- Existing sites are likely to have lower development cost than new sites (lack of land acquisition costs, precedent for planning permissions and acceptance by local communities) it may therefore be more economical to repower rather than replace capacity with new sites
- As a result, a significant proportion of this capacity could be repowered through either:
  - Developers taking on merchant risk in repowering
  - Developers finding CPPAs in order to lower the cost of capital associated with repowering
- Provided adequate policy support is in place, repowered sites may in cases offer highly competitive CPPA pricing given their lower development costs. Such support could include:
  - Renewal of planning permissions
  - Options to re-design that permit switching to larger turbines
- However, it remains to be seen whether they would satisfy the criteria for additionality among corporate offtakers
  - In theory, if the project requires a CPPA to repower, then it should be considered additional
  - If the project does not require a CPPA, then it is able to repower while taking on full merchant risk
- We do not further consider repowered projects as a separate category in the remainder of this report. However we note that there is the potential for such projects to make a contribution to the 15% CPPA target.

Contents

Drivers for signing corporate PPAs

Drivers include the need for corporates to decarbonize and for developers to achieve a bankable revenue stream as subsidy-based support is phased out across Europe

CPPAs have so far been the primary market instrument used in liberalised power markets to underpin project debt financing of subsidy-free renewables

Drivers for corporates

Renewable traceability
Some require strong evidence of 100% renewable traceability to meet the sustainability goals of customers, investors and other stakeholders, others have less stringent requirements

Additionality
Some require that their renewable projects are additional, i.e. would not have happened without their involvement; others are happy to be supplied by existing projects

Cost certainty
Some place importance on their energy costs being fixed for the long term in the context of volatile commodity prices and a long-term upward trend in end-user energy prices, whereas others are comfortable with shorter-term fixing

Cost savings
Some place priority on absolute cost savings, which tends to take precedent over traceability and additionality

Drivers for generators

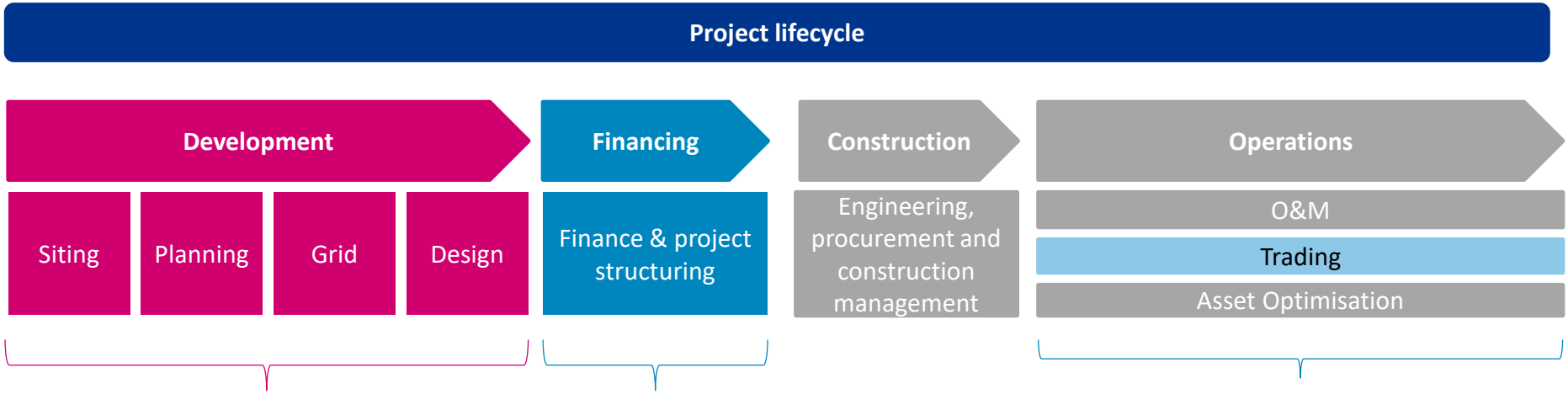
Removal of subsidies
The phasing out of subsidies for renewables in markets where they are deemed to be reaching parity with fossil fuel sources is driving generators to consider alternative means of securing long-term revenue streams

Project bankability
A long-term fixed revenue contract with a credit-worthy counterparty enables developers to borrow at a low cost of capital, thereby increasing the project's financial viability

Lower investment risk profile
Renewable generators use corporate PPAs as a risk management tool, increasing the fixed revenue element of their projects and reducing cash flow volatility

Corporate PPAs within the project lifecycle

Corporate PPAs enable financing of projects and are themselves enabled by competitive economics within the development process



Development activities influence LCOEs, and subsequently their ability to contract Corporate PPAs without subsidies

Corporate PPAs offer alternative to Government schemes as a means of enabling financial close

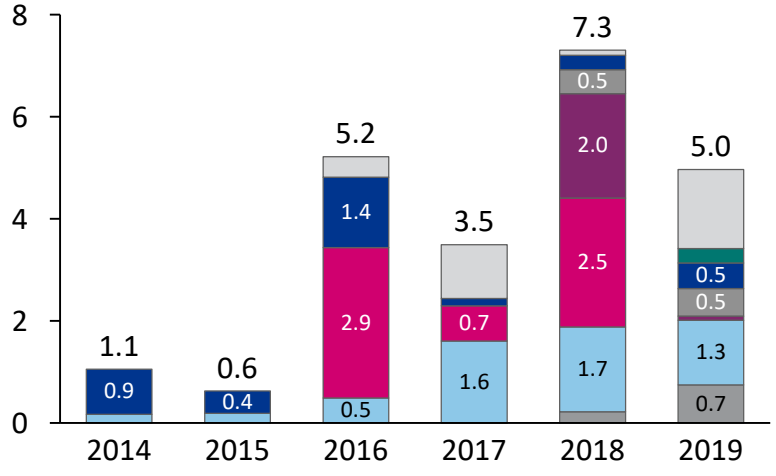
Corporate PPAs facilitated by trading environment through presence of robust wholesale pricing, forward market liquidity, and readily available risk management services

Corporate PPA volumes in Europe have been growing

Deal volume has grown substantially in recent years across Europe, driven primarily by strong demand from large tech and manufacturing giants in Scandinavia

The European CPPA market is still relatively nascent but has grown substantially since 2016

Estimated* European Corporate PPA volumes (2014-2019)
TWh p.a. contracted

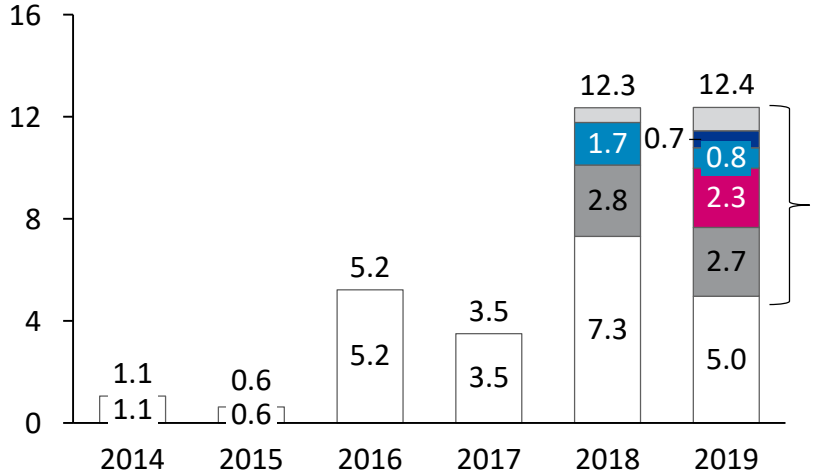


# deals	8	10	12	11	20	34

Other EU, UK, Denmark, Sweden, Ireland, Finland, Norway, Spain

Long term fixed-price PPAs between utilities and developers, enabling build out of unsubsidised or part-subsidised projects, have also become more prevalent in the last 2 years

Estimated* European Corporate and Utility PPA volumes
TWh p.a. contracted



# deals	8	10	12	11	28	65

Other EU, Belgium, Spain, Italy, Netherlands, Corporate PPAs

Source: Baringa research
Note: * Where only contracted capacity is reported, annual volumes estimated by applying a standard load factor assumption by technology and geography to each Corporate PPA deal. PPAs not aimed at fixing price (e.g., GB 'route-to-market' PPAs) and those between aggregators and suppliers (e.g., Statkraft in Iberia) have been excluded

What is driving CPPAs in other EU markets?

CPPAs have been enabled by a combination of healthy market conditions and subsidy schemes which retain generators' exposure to market prices

Country	Drivers	Can this be replicated in Ireland?
Scandinavia 	▲ **Legacy of long-term PPAs** between heavy industry and hydro plant ▲ **LCOEs below wholesale prices** driven by rich renewable resource and low development costs ▲ **Renewable obligation scheme** to further competitiveness of renewables vs wholesale prices ▲ **Government guarantee against default to mitigate credit risk** ▲ **Strong presence of data centres** / major tech companies ▲ **Market confidence** that wholesale prices will not decline significantly over longer term, partly due to moderating influence of hydro	▬ There is a perceived risk that Irish prices could fall further than in the Nordics ▬ An equivalent Government guarantee on credit risk may not be permissible by EU law ✚ Ireland can leverage strong data centre industry in similar manner to Nordics strong manufacturing base
Great Britain 	▲ **LCOEs below wholesale prices for some projects** due to good wind resource and moderate development costs ▲ **No renewables support scheme for new onshore wind and solar**	▬ Presence of RESS requires CPPA market to either sit alongside auctions or, alternatively, to integrate with them
Spain 	▲ **LCOEs well below wholesale prices** due to rich solar and wind resource and low development costs ▲ Strong interest from utilities willing to take long term price risk in order to capture value	▬ Spain particularly competitive in solar resource in Europe ▬ Large disparity between wholesale prices and PPA prices required to encourage utilities to take on long term price risk
Netherlands 	▲ **SDE+ "inverse floor" subsidy scheme** leaves exposure to very low (and very high) prices, which can be mitigated (or shared) through PPAs with corporates or utilities	✚ Flexibility exists within RESS to introduce a similar element of market exposure ▬ May not be deemed additional by some offtakers as some projects may be able to cope with price risk

Policy-based driver **Market-based driver**

Source: Baringa research

Corporate vs 'traditional' utility PPAs

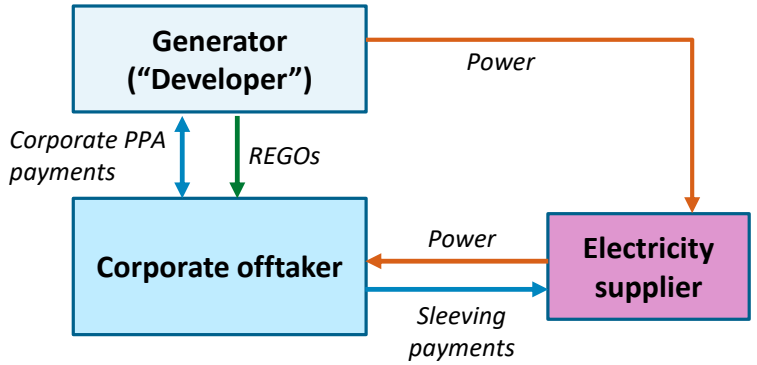
Corporate PPAs are contracted between the generator and end-user for a much longer term than a traditional PPA, which typically serves as a route to market for a generator offered by a trader

	Description	Counterparty groups	Example counterparties	Typical commercial structure
Corporate PPA	Power offtake agreement directly between Generator and end-use Customer	- Corporates (industrial & commercial) - Municipalities - Local buying groups	Microsoft, M&S, Google	- **Typically long term (10 – 20 years), fixed price** - If purely financial, will also require a traditional PPA in tandem
Traditional PPA	Power offtake agreement between generator and power market trader / supplier	- Utilities - Power traders / marketers	centrica, ElectroRoute, RWE, EDF, axpo, Constellation	- Typically pays generator a floating market price minus discount - Historically a subsidy scheme often pays a premium to up the floating market price - Term of contract varies - Historically limited appetite for fixed price or floor price, this is changing in some jurisdictions (e.g., Spain)

Main corporate PPA structures

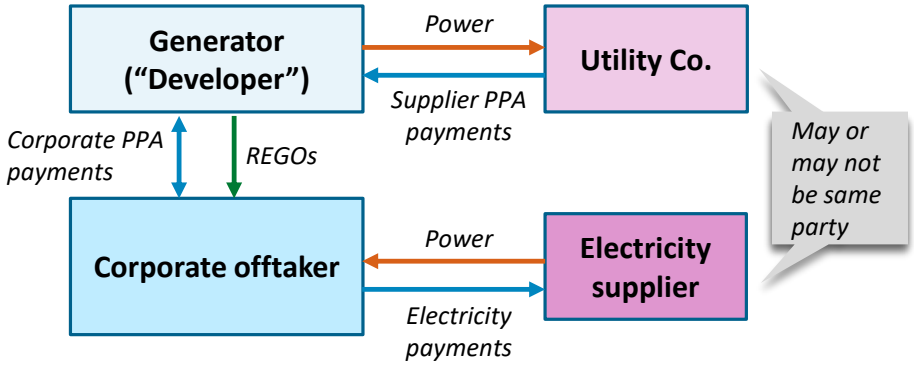
Corporate PPAs can be either physical or financial contracts – both structures have been deployed to date in Europe

Physical PPA



- Direct physical PPA between the corporate off-taker and the generator
- Separate contracting between corporate and its supplier to accommodate the direct PPA
- Most common contracting structure to date in Europe

Financial PPA (CfD, synthetic PPA)



- Contract for Difference (CfD) between the Corporate off-taker and the Generator, whilst maintaining the generator's traditional PPA with a supplier/trader and the Corporate's Energy Supply Agreement with its supplier
- Relatively new structure in Europe, popular in U.S. as it allows contracts across markets that are not physically connected (e.g., between a developer in Texas and an offtaker in New England)

Each PPA comes with risks that need to be allocated

Some risks need to be managed by both parties, others need to be explicitly allocated or shared

Risk	Definition	Contracting options/considerations	
Price risk	▪ Risk of unfavourable movement in power prices over the duration (10 – 20 years) of the PPA	**Carried by offtaker**	▪ Offtaker bears the mark-to-market exposure of the contracted fixed price versus floating market prices
Credit risk	▪ Risk that a counterparty is unable to honour contracted position in a timely fashion e.g., as a result of one party ceasing operations	**Carried by both parties**	▪ Both parties carry the risk that the counterparty may cease operating as a going concern ▪ Key barrier for lenders deciding to lend against 10 – 15 year PPAs
Short-term volume risk ('shape' risk)	▪ Risk that generation and demand profile do not match, resulting in additional trading in short term markets required to make up the difference	**Allocated to one or the other, or shared**	▪ Short-term risk sits with offtaker in a pay-as-produced PPA, with the generator in a 'baseload' PPA. ▪ The quantum of risk is reflected in the difference between wholesale prices and prices captured by the generator ▪ Long-term risk can be managed through use of volume firming agreements that protect the offtaker from lower than expected volumes
Long-term volume risk	▪ Risk of generation output varying from expectation over a year-to-year timescale, e.g. due to changing weather patterns or technology underperformance		
Imbalance risk	▪ Risk of physically under- or over-delivering power versus traded position, causing exposure to imbalance penalties from system operator		▪ Only relevant if contract is physical e.g., between generator and utility supplier
Development risk	▪ Risk that projects under development which have been contracted for do not become operational at all or in a timely manner		▪ There can be contractual protection and compensation in place to protect offtakers under the CPPA
Operational risk	▪ Risk of unexpected outage from power production ▪ Risk of lower than expected performance of asset		

Four requirements of a functioning corporate PPA market

Our experience in CPPAs tells us that a healthy pipeline of price-competitive projects seeking a route to market, and a framework for managing unique commercial risks and lengthy procurement processes are required for corporate PPAs to occur at scale

Baringa's 4 challenges to enabling Corporate PPAs

	Project pipeline seeking CPPAs	Value / price	Commercial risks	Procurement process
Description	***Ensuring supply**: the pool of projects seeking CPPAs as a route to market must be enough to meet the 15% target while facilitating competition for CPPAs*	***Ensuring demand**: the combination of price, additionality, traceability, price certainty and value that a CPPA offers for the large energy user*	***Managing risk**: the level of commercial, hedging and operational risks borne by each party must be acceptable to each party*	***Facilitating execution**: Simplifying and standardising contractual terms, as well as improving price discovery and market depth (i.e. liquidity) allows a broader base of end users capable of executing PPAs*

Contents

Participants in stakeholder engagement (1 of 2)

Our engagement included the following categories of "supply side" stakeholders including developers and their capital and advisory partners

Developers

Developers are the primary supply-side beneficiaries of CPPAs which enable financial closure to be reached on new developments. CPPAs can lower the cost of debt and attract more favourable equity terms for developers and therefore understanding the relationship between debt, equity and CPPAs is essential to effective policy design.

Finance partners

We extended our target engagement beyond developers to their debt and equity capital providers as adjusting the perceived risk and returns associated with the deployment of capital towards renewable projects is a primary motivation for promoting a CPPA market in Ireland.

Debt partners – a mix of those with lending experience in the Irish market and internationally, recognising that lending environments are unique to each country but lessons can be learned from other markets with more CPPA activity.

Equity partners – a mix of those who invest directly into projects early in development (i.e. higher risk/return), those with dedicated renewables funds investing at a later stage, and those who have historically had dedicated infrastructure funds which are candidates for renewables investment.

Legal advisors

Legal advisors are parties who work closely with developers on CPPA execution and could therefore offer a different perspective on CPPA sticking points and legal risks.

Insurance providers

Insurers may own certain risks within corporate PPAs such as weather intermittency or any long-term outage risk.

Groups for stakeholder engagement (2 of 2)

We engaged with “demand side” stakeholders including data centre owners, as well as other private and public sector energy users, suppliers, policy makers, and market /system operators

Data Centres

Owners of data centres are obvious candidates for CPPAs. This is due to the importance of energy costs to their cost base and, in the case of the global tech majors, their commitments to decarbonising their energy footprint.

Other private large energy users (LEUs)

Other large private energy users may be less likely to have engaged with CPPAs to date but this group controls a very significant energy demand, and its engagement will be important if the government is to meet its CPPA targets.

Public sector as a user

Government and the public sector is itself a large energy user and several publicly funded entities have a large energy footprint and in some cases considerable energy procurement expertise. The public’s relatively high stake in these entities may offer an opportunity to incentivise them to procure corporate PPAs through government policy.

Suppliers / traders

Suppliers of energy contracts to large energy users are a critical stakeholder both to provide a viewpoint on user behaviour and requirements, and a party which may be able to facilitate the adoption of CPPAs.

Operators / Regulators / Government

Consultation with the **System Operator** (EirGrid), and **Regulator** (Commission for Regulation of Utilities) was sought in order to be able to appraise possible interventions on the context of any proposed or planned changes to grid infrastructure and market design and operation.

Discussions with relevant **Government Departmental Stakeholders** were sought to identify areas of policy development crossover as well as Government approach.

Format of stakeholder engagement

We undertook both small group / bilateral conversations and an open industry workshop to obtain the broadest possible range of views

Structure	Party	Small group engagement	Workshop engagement
Supply side	**Developer**	▶ Face to face either one-on-one or in small groups of 2 – 3 stakeholders held over 2 days in Dublin; **Baringa only** ▶ Bilateral conversations over phone; **Baringa only**	▶ Industry workshop widely publicised and open to all attendees, **Baringa** + **members of steering group**
	Capital partners and advisors		
Demand side	**Data centres**		
	Other large energy users		
Other stake-holders	**System Operator**		
	Traders / suppliers		
	Government		

Smaller groups across a broad cross-section of stakeholders including those who have both experience in CPPAs and an interest in the Irish market

24 organisations interviewed

Broader industry workshop ensured the widest possible range of views was captured

64 workshop attendees

Summary of stakeholder feedback

- There is pent up demand for CPPAs among data centres and other LEUs with hard decarbonisation targets and experience of doing CPPAs in other markets
  - These corporates have experience pricing in the €30s / MWh in Europe, but may contract for €50s in SEM as this level approaches parity with wholesale prices
- Some large, consented onshore wind projects that benefit from economy of scale and, in particular, greater rotor tip height can offer this in the near term without subsidies.
  - There is a development pipeline of up to 500 MW of these, majority of which is awaiting necessary consents
- Developers are holding out for RESS auctions, meaning almost none of these competitive projects are actively seeking CPPAs
  - The ECP grid offer program is set up to serve the auction cycle, and thus will compound the problem if not revised
- Developers also face challenges in managing commercial risks associated with CPPAs that are not present in RESS contracts, namely:
  - Late delivery risk, whether caused internally or by external factors such as late connection delivery
- There are broader challenges to bring down the LCOE of projects in Ireland that might increase the pool of competitive projects in the mid-longer term
  - lack of large spaces to build projects at scale
  - level of uncertainty and delay in getting planning and consents
  - Business rates that are weighed towards existing capacity
- There are challenges to make CPPAs appeal beyond large multinational technology firms, namely
  - Credit risk of smaller energy users who don't have investment-grade balance sheets
  - Unwillingness to contract fixed-price for energy at 15 year tenors among users who's business cycle is shorter term (e.g., agri-food)
  - Within publicly-owned bodies, inability (and potentially unwillingness) to independently prioritise decarbonisation targets over cost efficiencies unless explicitly mandated to do so by Government

Conclusions from stakeholder engagement

Pipeline needs to speed up and competitive prices are required to attract offtakers

Project pipeline seeking PPAs | **Value / price** | Risks | Procure-ment

Many stakeholders say…

- The overall pipeline of new projects is held up by grid connection offers and planning uncertainty, with the latter being particularly poor in Ireland relative to other markets
- The pipeline of available projects for CPPAs is significantly hampered by the presence of RESS and a clear strategy for interaction of RESS with PPAs will be required

Some thoughtful ideas…

- Decoupling grid connection offers from the RESS cycle and fast-tracking projects with (or close to securing) CPPAs through the connection process could enable more projects to come to the CPPA market sooner

Less consensus around…

- Strategic planning (e.g., through SEZs) was touted as a way of delivering lower cost projects, however there appears to be plenty of greenfield development in process already since the government announced its 70 by 30 ambition

Many stakeholders say…

- Corporates generally place some premium on green energy that is traceable and, increasingly, additional
- Nevertheless those who do place value on these traits still require PPAs that are not significantly out of the money relative to market prices
- This requires prices to be in the €50s or (for a smaller subset of offtakers) €60s / MWh, which in the short-term means mainly onshore wind projects with large turbines and good grid connections are competitive
- Larger tip heights and rotors for wind projects are essential for making projects sufficiently competitive

Less consensus around…

- The level of value placed on traceability and additionally on the corporate side is mixed. Some corporates are vocal in their ambitions for both while other market participants observe a lack of enthusiasm elsewhere in the market

Conclusions from stakeholder engagement

Credit worthiness and long term price risk are the major commercial barriers

Pipe-line | Price | **Commercial Risks** | **Procurement Process**

Many stakeholders say…

- There is a relatively small number of counterparties with sufficient credit-worthiness to conduct PPAs that are bankable for 10 – 15 years
- Outside of data centres, very few organisations are willing to hedge beyond 5 years due to the level of volatility within their respective markets and the typical length of the business planning cycle
- There may be significant price risk in PPAs as wholesale prices could come under pressure as more renewable energy comes on the system

Some thoughtful ideas…

- There is a broader issue with the lack of forward liquidity in SEM that is synergistic worth CPPAs –
  - More forward liquidity will enable more CPPAs by de-risking merchant exposure through ready availability of forward hedges to lock in pricing
  - A stronger PPA market might itself stimulate more forward liquidity as organisations get more comfortable with making multi-year hedges

Many stakeholders say…

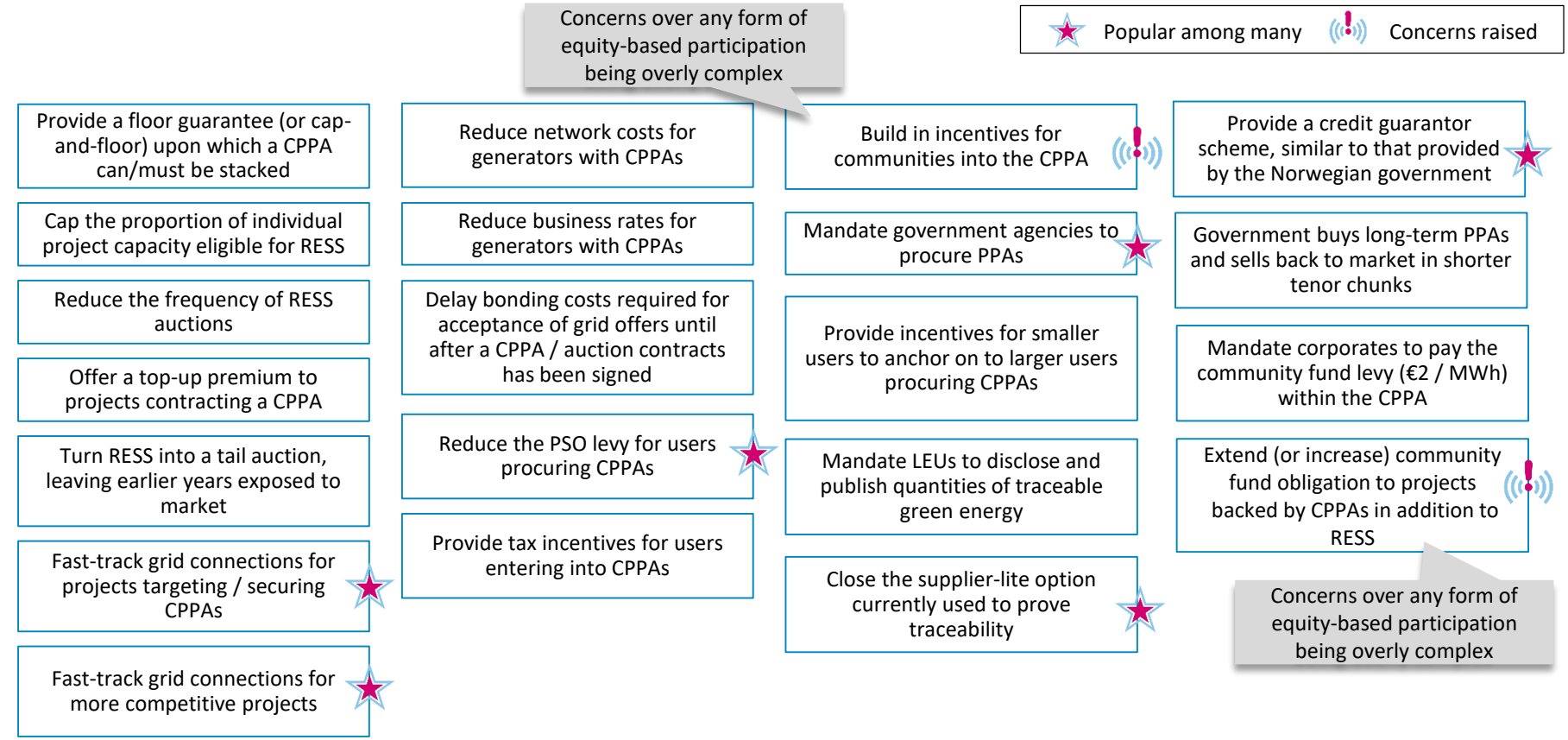
- Many large energy users do not have experience in PPAs and therefore lengthy procurement processes will be required
- However, this is not the primary barrier to doing CPPAs and pipeline, value and commercial risks represent bigger barriers at present

Some more thoughtful ideas…

- Where corporates are new to PPAs, suppliers and developers can be more proactive in flagging risks early in order to engage sufficiently senior stakeholders within the corporate entity
- Within the public sector, there is a need to abide by EU procurement rules that will need to be engaged with early in the event of any mandate for CPPA procurement

Ideas for CPPA interventions arising from feedback

A number of policy interventions targeted at addressing barriers to CPPAs have been suggested by stakeholders



These have been incorporated into our longlist of interventions evaluated in this report

Detailed feedback on data centres

Data centres are willing to do corporate PPAs but are struggling to find credible counterparties

Data centres (DCs)

Project Pipeline seeking CPPAs

- DCs are in the market for doing PPAs in Ireland

  "We want to do PPAs where we have physical load demand. That means doing them where our data centres are, so we are keen to do them in Ireland"

  Data Centre B

- However, DCs who are actively seeking CPPAs feel there are currently not enough projects to engage with

  "…If there's going to be a support scheme of some kind on the other 55% then the question is how corporates are supposed to see a true competitive market. If you make 2 markets then you halve the competition…"

  Data Centre C

- There is a recognition that this is being caused by developers holding out for RESS 1

  "…I was more popular a year ago, now no one wants to meet for coffee, they're all busy with their RESS application…"

  Data Centre A

- There is acknowledgement that direct wire* opportunities will be challenging for DCs given their preferred location around the greater Dublin area

  "…Direct wire is challenging, you're not going to get wires in from around the country on to (a DC located on) the M50…"

  Workshop participant

Value / price

- DCs emphasise the need for CPPAs to offer value versus market prices…

  "…It's one small market among many for us, and it's hard to argue for doing a PPA here when prices are so much lower elsewhere in Europe…"

  Data Centre A

  "…You won't see many PPAs on projects that are in the 60s or 70s (€/MWh). It starts to be much more feasible for them once you get into the 50s…"

  Developer

- …but also see a CPPA as a necessity to manage reputation

  "…Green-ness is everything to their customers. They've had staff walkouts because they're seen not to be doing enough…"

  Data Centre Association

  "…We see a corporate PPA to some extent as a cost of doing business in Ireland. It's about reputation management…"

  Data Centre A

- Other market participants have observed varying value placed on an additionality-enabling CPPA by DCs

  "…Additionality is our north star. Traceability is secondary…"

  Data Centre A

  "…Some corporates are gold standard and need additionality, silver standard is GoOs from Europe. Bronze is "I'll buy GoOs from old hydro in Sweden". I know of 1-2 data centres in each category…"

  Developer

Risks

Procure-ment

Note: Direct Wire refers to developments on-site or near-site where the infrastructure required to transfer power from farm to user is developed privately and does not form part of the public grid infrastructure

Detailed feedback on data centres

Data centres are capable of managing longer tenors but have concerns over delivery risk

Data centres (DCs)

Pipe-line | Price | Commercial Risks | Procurement Process

- DCs are comfortable taking on a 15 year tenor as it aligns with their asset cycle

  "…PPAs make sense for us because they fit well with the business lifecycle, the contract isn't going to outlive the data centre…"
  Data Centre

- However, there is concern that market prices may fall significantly due to cannibalisation as new wind comes online, pushing contracts out of the money

  "…We would want to see cannibalisation risk addressed before we enter into a PPA in Ireland…"
  Data Centre C

- There is also some concern over the credit-worthiness of data centre owners, given their relatively young age

  "…They may be the obvious counterparties in Ireland but dealing with them is not that straightforward. Facebook has only be operational for 15 – 17 years so to take a 15 year view on them is difficult…"
  Bank / Debt financer

- Delivery risk is material as it puts hard green targets at risk…

  "…We're much more strict than RESS will be on delivery dates. We have hard carbon targets to hit and we need to impose hefty clauses for late delivery to ensure they're met. Developers aren't used to that…"
  Data Centre A

- …but this has proved challenging for DCs who have attempted PPAs in Ireland as delivery dates can be out of developers' control

  "…Delays happened right through form planning through to availability of ESB [network] engineers for commissioning. Sometimes the lads don't show up and you get "we'll be there in a couple of weeks"…that's not good enough for a CPPA offtaker…"
  Supplier / trader

- DCs are typically able to bring required resource and experience from other jurisdictions in order to execute CPPAs

  "…The corporates bring the contractual experience -they draw up terms and the developer can get their head around them and amend…"
  Developer

- However, understanding of the Irish market is not always clear, particularly in relation to treatment of GoOs

  "…We're still working to understand the GoO system in Ireland, to us it's just not that clear…"
  Data Centre B

- DCs may also walk away from negotiations if there is material reputational risk from community objection

  "…The thing Tim Cook really doesn't want to hear is that there's a dispute on a wind farm in Ireland, so community objection is a big thing, that's why Apple didn't build a DC in Galway…"
  Developer

Detailed feedback on other private sector users

Other private sector users are less ready than data centres to seek CPPAs but are starting to seek opportunities and value additionality

Other Private Large Energy Users (LEUs)

Project pipeline seeking CPPAs

- Companies in Ireland have generally not engaged enough with CPPAs to date to comment on available pipeline

  "…Our focus areas to date have been efficiency savings. PPAs are only coming onto the agenda…"
  Company A

  "…"There's a lack of priority and focus from the corporates here. No deadline, endgame, no hard stick or carrot…"
  Bank

  "…The bigger question for us is how to green up our gas usage. We're heavily reliant on a CHP unit…"
  Company C

- Some are investigating on-site opportunities and have noted cost of connection and inability to do private wiring as a barrier

  "…It could cost us up to 500k to do direct wire and we would have to go to our global corporate function to get funding for it…"
  Company A

  "…A lack of ability to do private wire is definitely holding some opportunities back…look at Intel, they've had to just build new grid themselves (to service growth in electricity demand)…"
  Workshop participant

- However, private wire opportunities may not represent a material component of the broader CPPA opportunity

  "…(Private wire) is very limited from a geography PoV, they'll be only a handful of big projects…"
  Developer

Value / price

- Companies recognise the need to prove additionality in procuring green power and see 'greenwashing' with GoOs as a short term solution

  "…We have hard targets for greening up our electricity supply and we don't like greenwashing, so we will look for a PPA soon…"
  Supplier / trader

  "…At the moment we use carbon credits but we see it as green washing and we want to move away from it…" – Company A

- Companies believe that initiatives to achieve green targets (including CPPAs) can be driven by value

  "…We're willing to stretch economic returns up to a point to go green. We normally look to 3 – 5 year RoI, we can stretch to 6-9 years for decarbonisation related investment"…"
  Company A

  "…It looks like there is a potential financial return in PPAs we've done elsewhere, which we weren't expecting to begin with, we were assuming that decarbonisation was something we were going to have to pay for…"
  Company B

- Within some sectors there may be scope for aggregating demand among groups of companies, particularly where there is not acute competition

  "…I think there would be will in Ireland to group up, in the food sector at least because it's an export market so we're not competing heavily against each other…"
  Company C

Risks

Procure-ment

Detailed feedback on other private sector users

Long tenors and offering required credit assurances are barriers for other private sector users

Other Private LEUs

Pipe-line | Price | **Commercial Risks** | **Procurement Process**

- There is a gap in understanding of commercial risks involved among candidate companies

  "…I've had informal chats with some of the big lifesci players about PPAs…you could see on their face that it was the first time they'd fully comprehended the risks…"
  Data Centre

  "…I wasn't prepared for the complexity of PPAs. It's been a steep learning curve…" – Company B

- Credit risk is a barrier for some companies who do not have a parent group as a guarantor

  "…We're one of the biggest corporate banks in Ireland so we know who is out there and we don't think that there's a huge pipeline of credit worthy counterparties bankable for 15 year contracts…"
  Bank

  "…The fact that we're investment grade will make it easy for us but it's not so easy for everyone…" – Company B

- Companies are often not able or willing to contract tenors beyond 3 to 5 years, with some preferring even more flexibility to facilitate volatile production

  "…In our sector we've got volatile prices and tight margins, so we need flexibility to ramp up and down activity, we can't enter into long-term contracts…"
  Company C

  "It'll be very challenging getting those smaller energy users to go over 5 years. They're not used to doing such long-term contracts"
  Industry Group

- Companies recognise that there is a significant opportunity for PPAs which can offer a 5 year tenor or below

  "… If you can get tenors down to 5 years then you should unlock more demand. 5 years fits with a budgeting and a strategic cycle of many firms…" - Bank

- Some companies who will be in the market for CPPAs in the next few years do not have experience in the time and length required to do a CPPA

  "…The mid-tier guys can't invest the same time as, say, an Amazon can…" – Industry Group

  "…We've been looking into onsite solar but I wouldn't expect to spend more than 6 months from start to finish…" – Company A

- As with data centres, some consider community engagement and reputational risk management to be a crucial part of the process

  "…We wouldn't want to do a CPPA with any project that didn't have community support. We want to know who owns the land, who are the neighbours…"
  Company A

- This is sometimes more locally focussed, and a remotely sourced PPA can therefore be an advantage

  "…We're in a rural area and feel like patrons of the community, we own any problems here…"
  Company A

  "…By procuring from a remote project, we minimising risk of corporate relationship with local community…"
  Workshop participant

- There may be opportunity to improve process speed by driving PPAs up the corporate agenda

  "…It can't be the procurement guy, the treasury guy needs to get pulled into the conversation early…" - Bank

Detailed feedback on public sector users

Public sector users have limited understanding of CPPAs and are unlikely to pursue them unless mandated by Government

Public sector users

Project pipeline seeking CPPAs

- The public sector in Ireland have generally not engaged enough with CPPAs to date

  "…We've been watching what Amazon did but they're keeping mum about everything so we have a bit to learn…"
  Public User A

- There are no hard incentives at present to drive public sector procurement towards PPAs

  "…We have an initiative to develop a glide path to CO2 neutrality but there's no hard target…"
  Public User A

  "… At the end of the day if we aren't hitting efficiency targets, no one is going to go to jail. It's not the most important thing on our agenda…."
  Public User B

- Direct wire opportunities may be material

  "…We've looked at on-site opportunities, we're (one of) the biggest landowners in Ireland…."
  Public User B

Value / price

- The public sector is typically cost focused in procurement unless mandated by their public owner to pursue specific green targets

  "…We have to be commercial as a company, economics have to stack up. We can't be going into deals that aren't commercial…"
  Public User B

  "…Even if we understand the risks, we'd have to have the regulator and government backing us…"
  Public User A

Commercial risks

- Public sector procurement bodies are generally unfamiliar with the commercial risks involved in CPPAs

  "…To be honest we haven't had any serious engagement with CPPAs to date…"
  Public User B

- However, in principle they are suited to long term tenors and are credit worthy as counterparties

  "…Our pricing is regulated and we have a strong sense of what demand is going to be over the next decade or two…"
  Public User B

- Nevertheless they are wary of long term tenors due to the price risk involved

  "…It's hard to get excited about hedging because how do you know if it's a good deal or a bad deal? We got burned a few years ago with a drop in brent crude…"
  Public User B

  "…We're not trendsetters, we're risk averse. Its took us years to get used to the idea of 3 year contracts…"
  Public User C

Procurement process

- There is a need for public sector procurement to abide by EU procurement rules which will prevent bilateral negotiations

  "…We're bound by European Procurement Directives…we're steered away from bilateral negotiation procedures…"
  Public User C

- There is also acknowledgement that the public sector is inexperienced in procuring PPAs

  "…We're aware that we will need professional help in that procurement process…"
  Public User A

  "…I don't even know if we need to set up new processes and capabilities…"
  Public User C

Detailed feedback from developers, capital and advisors

Developers are seeking corporate PPAs for more competitive projects but think the pipeline of projects should move quicker and needs to integrate with RESS auctions

Developers

Project pipeline seeking CPPAs

- Planning decisions and timely grid connections are considered to slow up the pipeline of projects available

  "…ECP-2 will allocate to the biggest projects but it's going to take a while for that to happen so those offers won't hit the system for 18 months…"
  Developer A

  "…An Bord Pleanála planning timelines run up to 2 years and should be brought back down to 6 months. It's caused by a mix of objections and a lack of commitment to timing…"
  Developer B

  "…Government has got itself into a situation of losing control of its planning and consent system, everything is grinding to a halt, and extraordinary delay can be caused without a test for how material your concern is…"
  Developer A

- For projects that are available, developers express desire to push projects into CPPAs in order to reduce their portfolio's exposure to RESS

  "…There is value for developers in feeding through pipeline consistently rather than cyclically through RESS auctions…"
  Developer A

  "…CPPAs are starting to happen, we're involved in 2 CPPA transactions at the moment…"
  Bank

- However, there is recognition that the pipeline is not moving as fast as it could be towards CPPAs as a result of RESS

  "…there doesn't seem to be an urgency to recycle capital or pursue PPAs, many developers are happy to sit on projects and wait for RESS to come about…"
  Supplier / trader

  "…You need less RESS auctions to drive people to see if market fills it…" – Developer B

Value / price

- Developers think CPPAs can offer value on more competitive projects

  "…We've got very close doing CPPAs here so there is activity and people will work with us and at prices that work but it will only be for the very best of projects…"
  Developer A

- However, developers feel that actions around business rates and permitted technologies must be taken to facilitate competitiveness, with onshore wind most likely to be competitive at present

  "…Larger tip heights, tower heights and rotors for onshore wind are the way to get prices down to 50s or 60s …" - Developer C

  "…If you make business rates fairer and you speed up planning, you will see prices come down…"
  Workshop attendee

- Less competitive projects, including solar projects, are not seen as ideal candidates for CPPAs by some developers

  "…It needs to be near €50 / MWh or below to really unlock the CPPA world…"
  Developer B

  "…For solar people were saying 50 euro to 110 euro last year. People who are more in the know are seeing more around 70s. Those 50s people have all gone quiet…"
  Supplier / trader

- There is some mismatch of expectation in pricing among smaller developers

  "…We need something in the low 70s to get moving and we want CPPAs as a backup for RESS…"
  Developer D

Risks

Procure-ment

Detailed deedback from developers, capital and advisors

Developers need 15 year tenors and are moving to accept additional risk associated with CPPAs

Developers

Pipe-line | **Price** | **Commercial Risks** | **Procurement Process**

- 15 year tenors are seen as essential by experienced developers

  "…You need to borrow for 15 years' worth of revenue, some banks will let you borrow that against an 8 year PPA but in our opinion that's too risky…"
  Developer B

- There is concern among developers and lenders that the pool of credit-worthy counterparties for 15 year PPAs in Ireland is relatively small

  "…A lot of companies that might be interested just aren't credit worthy…"
  Developer B

  "…We lend to medium sized corporates for a max of 7 years, so 10-15 year lending is something really risky for us…"
  Bank

- Larger developers acknowledge that they must accept the additional risks associated with CPPAs

  "…We had to take on more risks with CPPA but we've been expecting that for the last 20 years. We didn't expect to be babied. We never expected subsidies to continue indefinitely…"
  Developer B

  "…We've bought an off-subsidy asset as a small test case to gain experience in doing CPPAs in Ireland…"
  Developer C

- Shorter term tenors are cited frequently, but only as an opportunity for projects coming off of REFiT subsidies

  "…We could see PPAs with 3 – 5 year tenors as a way of de-risking revenue streams in our off-subsidy assets in the future, (thereby) improving our credit rating…"
  Workshop attendee

- The lack of experience and commitment among potential among some corporate offtakers is seen as a barrier

  "…You could spend a year talking to them and end up getting nowhere. Something that says 'you need to do it by this deadline' would get around that…"
  Developer C

Detailed feedback from other market participants

Suppliers and traders are well placed to manage some commercial risks, but not all

Suppliers, traders, regulator, operator

Project pipeline seeking CPPAs

- There are no domestic **regulatory barriers** to altering auction design to facilitate more pipeline of projects for CPPAs

  "…There are interactions between us and Government on the design of auctions but as an advisor, we don't have regulatory barriers (that auction design needs to meet)…"
  CRU

- However, there is **planning risk** associated with the delivery of grid connections which can affect delivery and which is currently beyond the control of grid operators

  "…Once a connection offer is accepted it takes a few months to several years to build. It will be a few months if it's just a control system to be installed by the developer where there is 220 kV – 400 kV transmission lines to be put up, it may take 7+ years to get through planning…"
  Eirgrid

Value / price

- There is a lack of clarity among **suppliers** on how to provide traceability through GoOs to users who value them

  "…Simplicity of GoOs and retiring them is something our customers find it very difficult to get their head around…"
  Supplier / trader A

  "…I think GoOs work in practice, though there might be some logistical issues at present…"
  Supplier / trader B

Commercial risks

- **Suppliers and traders** do not currently intend to own long term price risk in order to bridge between developers' need for long term contracts and offtakers' need for shorter tenors

  "…Our role isn't to take 10 year fixed price, it's more to take balancing risk…"
  Supplier / trader B

  "…I can't see us taking long term price risk unless there's some sort of floor scheme attached to it to protect us…"
  Supplier / trader A

- **Suppliers and traders** are actively engaging the market to manage volume shape, and imbalance risk in PPAs

  "…We're very happy to take balancing and shape risk in order to make PPAs happen, we see that as our role…"
  Supplier / trader B

Procurement process

- **Suppliers**' experience with their commercial / industrial customers suggests that CPPAs will need to be simplified if they are to extend beyond the large multinational DCs

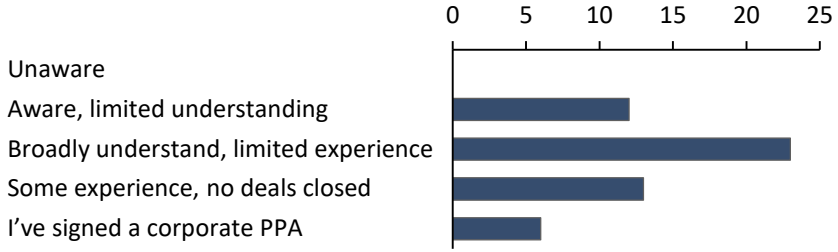
  "…Tier 2 is not just about scale, it's about sophistication and education. J&J went out to market a few years ago and needed a lot of education. There's an execution risk there…"
  Supplier / trader B

Workshop live polling results

Live anonymous polling of workshop attendees helped to validate issues raised in individual stakeholder feedback with respect to pricing, value drivers, and price risk caused by long tenors

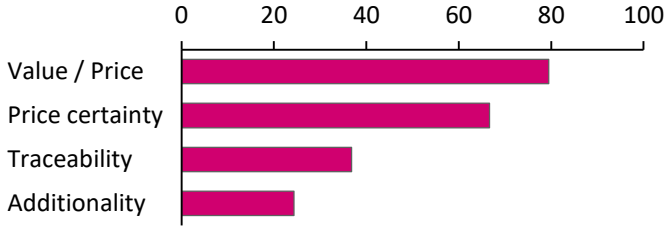
Levels of experience are mixed but there are some active players

Q: What best describes your experience and knowledge of corporate PPAs?
Number of respondents



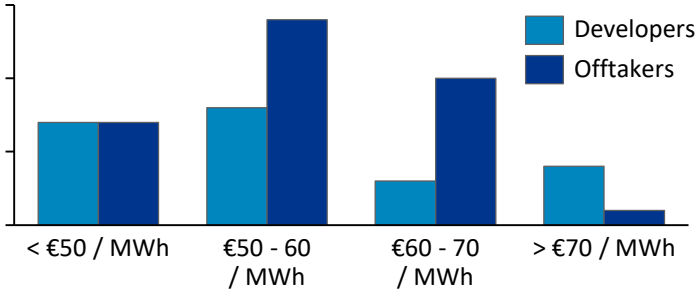
Price is paramount in importance among offtakers

Q: Rank these criteria in order of importance in procuring green electricity
Percent of respondents ranking factor within top 2 factors



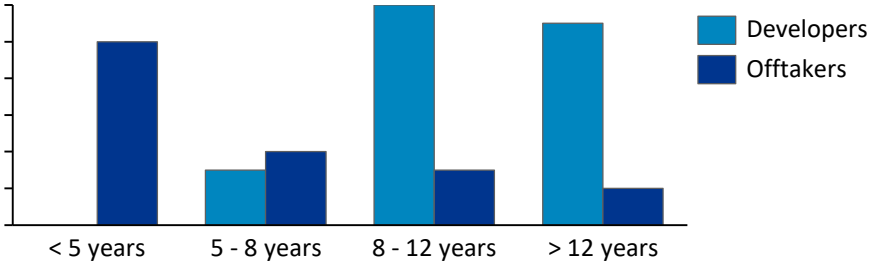
There is overlap in prices expectations in the €50s and €60s (/ MWh)

Q: At what range of strike price does a corporate PPA become interesting?
Number of respondents



…and there is a gap in preferred tenor ranges

Q: the minimum tenor range I would consider for a Corporate PPA is:
Number of respondents



Source: Mentimeter live polling of SEAI / Baringa / IDA workshop Tuesday 10th December 2019

Contents

Scope of intervention

Interventions that enable CPPAs sit within a broader set of conditions that must be in place to efficiently deliver the 70 by 30 target

LCOEs	▲ Lowering the development cost of renewables in Ireland
Market	▲ Facilitating a liquid market with robust pricing that maintains confidence of participants
Pipeline	▲ Facilitating a healthy and competitive project pipeline that ensures competition for both CPPAs and RESS auctions
Grid	▲ Upgrading grid to function for 70 by 30 scenario
Services	▲ Nurturing flexibility, storage and grid services markets

Critical to ensuring a healthy CPPA market, but assumed to be part of the BAU baseline for this analysis as they are critical to the overall 70 by 30 transition

Relevant stakeholder feedback is reported but interventions are not appraised

CPPA/ RESS complementarity	▲ Integrating CPPAs and RESS such that neither is compromised by the other and both work in harmony to achieve targets
CPPA market	▲ Maximising demand for CPPAs and other green products that aid project completion among energy users, through minimising CPPA-specific costs, risks, and other barriers

In scope for individual policy rationalisation versus BAU baseline within this report

Scope of intervention

Interventions are limited those which promote new generation capacity outside of RESS, which includes but are not limited to a PPA between an generator and an end-user

In scope

- **Additionality-enabling Corporate PPAs** - PPAs which lower cost of capital for new projects and therefore underpin final investment decision on new (or repowered) RE projects
- **Additionality-enabling traditional PPAs** – PPAs between generators and suppliers that lower cost of capital for new projects and therefore underpin final investment decision on new (or repowered) RE projects
- **Enabling merchant risk:** Policies which allow new projects or developments to reach financial close with a higher degree of exposure to floating market prices

Not in scope

- **Policies** aimed at reducing the cost of funding RESS scheme **without enabling merchant risk or additionality-enabling PPAs**
- **Corporate PPAs which do not enable additionality** e.g., where additionality has been primarily underpinned by another PPA or by REFiT / RESS

For clarity, we will group both of these under 'CPPAs' in the stakeholder feedback and analysis that this report discloses

Categories of intervention

We have considered several target areas for interventions in order to develop a longlist of possible options

Changes to future RESS auctions

- Changes to the structure and rules of the RESS auction that are aimed at ensuring both CPPA market and RESS auction have a healthy and competitive pipeline or projects. All other interventions except those in this category are appraised on the assumption that the RESS auction does not change

Other developer targeted interventions

- Interventions that specifically incentivise developers to seek CPPAs or other merchant routes to market (RtMs), either directly or implicit in other interventions

Market-making initiatives

- Interventions that facilitate the execution of CPPAs without targeting one stakeholder group e.g., through standardisation, risk socialisation, education and marketing

End-user targeted interventions

- Interventions that specifically incentivise large energy users to seek CPPAs or other merchant RtMs, either directly or implicit in other interventions

Supplier / trader targeted interventions

- Interventions that specifically incentivise energy traders and suppliers to seek long-term fixed-price offtake agreements from generators

Removing peripheral barriers

- Interventions that remove barriers that currently prevent CPPAs from occurring where both parties are sufficiently incentivised to do so e.g, community buy-in, physical/network and regulatory hurdles

A list of interventions has been developed by considering each of these categories and is based on our experience of other power markets and on stakeholder engagement conducted for this report

Longlist of interventions for corporate PPAs

Popular among many | Suggested by some | Concerns raised

Target area	#	Intervention	Intention	Suggested in feedback
Changes to future RESS auctions *(applicable to RESS 2 and beyond)*	1	**Cap the % of an individual project's capacity** that is eligible for RESS	*Creates a demand for CPPAs among generators by leaving a gap between revenue guaranteed from RESS and level of guaranteed revenue required to reach financial close, A CPPA on capacity not eligible for RESS would therefore stack on top of a successful RESS contract*	✓
	2	**Create tail-auction**, leaving first 5 years for CPPAs (Tail could be a commitment or option contract, fixed or floor)	*Creates a market for 5 year fixed-price PPAs by offering generators some revenue certainty on years 5+, leaving a gap between revenue guaranteed from RESS and level of guaranteed revenue required to reach financial close*	✓
	3	Leave some **market price exposure** within RESS **pricing structure** - either replacing strike with a floor or capping difference payments (as in Netherlands)	*Signals to the market that the RESS auction is supposed to be a floor upon which a further PPA with a corporate or utility can be utilised to further stack guarantee revenues*	✓
	4	Reduce **ratio of auction clearing volume** to auction **participation volume**	*Shifts more projects away from RESS and into the CPPA market, making the CPPA market more competitive and lowering the burden of RESS*	
	5	Reduce **frequency of auctions** (e.g., to every 3 years)	*Reduces incentive for projects that are unsuccessful in one auction round to wait for further auctions*	
	6	**Open up RESS auctions** to private energy buyers	*Allow private entities to contract in the RESS auction using RESS contract T&Cs, thereby allowing private buyers to benefit from the process infrastructure provided by the auction. Private buyers could accept / compete for bids not accepted by RESS.*	✓

Longlist of interventions for corporate PPAs

Popular among many | Suggested by some | Concerns raised

Target area	#	Intervention	Intention	Suggested in feedback
Developer-focused	7	**Fast-track grid consents** on more competitive / otherwise ready projects to ensure larger gap between connection offer and auction	*Creates a gap between being shovel ready and RESS auctions for projects that are more likely to seek out CPPAs due to being more competitive, thereby increasing propensity to seek a CPPA*	★
	8	Consider additional measures to facilitate **direct wire** for projects which have a CPPA in place as part of Direct Wire CAP policy formation	*Increases pipeline of projects seeking a CPPA. Further analysis required on what measures are possible by relevant policy group*	🏍
	9	Offer a **fixed premium** (funded through PSO) per MWh to generators for every MWh contracted under CPPA	*Similar to a renewable obligation certificate scheme but only applicable to MWh contracted under CPPA*	🏍
	10	Reduce local authority **business rates** for projects holding CPPAS	*Lowers the project LCOEs which can be passed through to CPPA strike prices*	★
	11	Guarantee grid connection for financed projects not supported by PSO ("**grid-follows-funding**" approach)	*Provide extra incentive to seek out CPPAs before considering RESS by shortening the project development timeline*	🏍
	12	Reduce or remove **network costs** for projects occurring **close to CPPA demand base**	*Incentivises end-user developing own projects by paying back costs avoided in alleviating transmission network. May facilitate 'local solutions' type branding for end users*	🏍
	13	Delay **bonding costs** required for acceptance of grid offers until after a CPPA / auction contracts has been signed	*Incentivises end-user developing own projects by paying back costs avoided in alleviating transmission network. May facilitate 'local solutions' type branding for end users*	🏍
	14	Reduce % of **network costs** borne by renewable generators with CPPAs	*Make merchant renewables more competitive by socialising network costs more among non-renewables and / or consumers.*	

Longlist of interventions for corporate PPAs

Target area	#	Intervention	Intention	Suggested in feedback
End-user focused	15	Provide **tax incentives** to corporates entering into CPPAs	*Same effect as removing the PSO levy but with different branding*	
	16	Remove the **RESS component of the PSO levy** for users with CPPAs	*Remove or reduce the levy that corporates pay to support renewables development, improving the economic attractiveness of PPAs for corporates*	
	17	Remove the **entire PSO levy** for users with CPPAs	*Remove or reduce the levy that corporates pay to support renewables development, improving the economic attractiveness of PPAs for corporates*	
	18	**Close the supplier-lite option** for corporates seeking traceability and supplement GoOs with an Irish Guarantee of Renewables ("IGoR") scheme for all units produced outside of RESS	*Make it impossible for users to claim traceability by setting up supplier-lite entities that achieve a 100% fuel mix disclosure by off-taking from subsidized generators, thereby making CPPAs the only alternative to achieving traceability*	
	19	**Mandate primary EPC contractors on public works** to procure CPPAs in order to be eligible for major (Project Ireland 2040) infrastructure projects	*Forces major EPC construction firms, who are typically LEUs, to procure PPAs*	
	20	Offer **subsidies/ tax breaks for communities** willing to aggregate a portion of their demand into a CPPA	*Incentivises communities to aggregate up demand in order to procure a PPA*	
	21	Offer **protection against basis risk** for energy users wishing to procure energy from Irish farms	*Increases the pool of potential end user volume to cover demand in adjacent markets*	
	22	Provide **incentives** for small/ medium energy users (**S/MEUs**) to anchor on to LEUs procuring CPPAs	*Expands potential reach of CPPAs to users not able to run procurement on their own.*	

Popular among many | Suggested by some | Concerns raised

Note: *Basis risk is the risk caused by exposure to different price indices e.g., a UK large energy user with a PPA in Ireland referenced against SEM prices and an electricity supply agreement with a UK utility referenced against GB wholesale prices

Longlist of interventions for corporate PPAs

Target area	#	Intervention	Intention	Suggested in feedback
End-user focused	23	Mandate LEUs to **disclose quantities and sources** of **traceable green energy**	*Creates demand for CPPAs as a means of providing traceability by putting more social pressure on LEUs to achieve traceability*	
	24	**Mandate LEUs to contract** a minimum amount of **unsubsidised Irish RE** (e.g., through mandating of GoOs of Irish origin)	*Keeps burden on LEUs to underpin merchant RE but does not force them into long-term PPAs, leaving the optimal solution to be determined by the market*	
	25	**Mandate LEUs** to procure a % of their total electricity demand from **CPPAs**	*Forces organisations to sign additionality-seeking power products (PPAs or otherwise) or face penalties*	
	26	**Mandate parts of the public sector** to contract CPPAs	*Forces organisations with large energy footprint that are funded by state to sign additionality-seeking power products (PPAs or otherwise) or face penalties*	
Supplier focused	27	**Mandate suppliers** to contract a minimum amount of **unsubsidised RE output (**e.g., through mandating of Irish GoOs)	*Adds a premium to the value of renewable power but keeps generators exposed to market prices and leaves suppliers with task of optimising who pays (LEUs, SMEs, homeowners). More market-based than mandating LEUs as suppliers are required to solve for who values the GoOs more. Worst case scenario, any additional cost is passed onto all customers*	
	28	Government subsidises a portion of **imbalance costs** for volumes contracted under CPPA	*Reduces imbalance 'sleeving' costs, potentially attracting more market making activity from sleevers*	
	29	Create an **additionality accreditation** scheme and **mandate** suppliers to offer additionality products	*Forces suppliers to make the market by creating standardised CPPA products*	
	30	Create an **additionality accreditation** scheme and offer a **premium** on 'additionality-green' power products / tariffs	*Encourages suppliers to take on CPPAs which qualify for the additionality credit and which can then be disaggregated among customer base*	

Popular among many | Suggested by some | Concerns raised

Longlist of interventions for corporate PPAs

Baringa

Popular among many | Suggested by some | Concerns raised

Target area	#	Intervention	Intention	Suggested in feedback
Market making	31	Create a **CPPA** exchange (public or through private partner) to offer standardised terms, liquidity and price signaling for CPPAs	*Reduces execution and procurement barriers to PPAs for users willing to accept the standard terms*	
	32	Offer a specified **floor guarantee** to generators on long-CPPAs	*Mitigates price risk for both sides by guaranteeing the generator a floor price, which in turn can guarantee the off-taker exposure to prices below the floor. If PPA @ 50, floor 30, prices @ 25, then Government pays 5 to gen which gets passed on to offtaker*	Suggested by some
	33	**Sell off government's legacy REFiT exposure** as CPPAs to large energy users	*Achieves a portion of the CPPA target by selling legacy REFiT contracts at current market rates, crystallizing and fixing government exposure on those REFiT contracts*	
	34	Public/Gov Co. **warehousing of CPPAs**, public funds buys up 15-20 year PPAs and sells them in shorter tenor chunks to large energy users	*Similar to tail auction in its intention to remove tenor mismatch but does not put onus on developer to find CPPA to reach financial close*	
	35	**3rd party acts as guarantor in case of default** of either counterparty	*Removes credit risk*	Popular among many
Peripheral barriers	36	Government provides the €2/MWh **community fund obligation** to projects backed by CPPAs in addition to RESS	*Offer parity in value to community of PPA backed projects versus RES backed projects*	
	37	Mandate principles to adhere to for community engagement for CPPA backed projects	*Offer parity in value to community of PPA backed projects versus RES backed project*	Concerns raised
	38	**Mandate LEUs/developers** to pay the €2/MWh **community fund obligation** for CPPAs	*Offer parity in value to community of PPA backed projects versus RES backed project, but with a positive PR message for corporates*	Suggested by some

Broader interventions of relevance

The following interventions which have been raised by stakeholders are not CPPA-specific and are therefore not assessed fully. However, they may help develop the CPPA market by improving overall market functionality

	Intervention
Grid	Define responsibilities for maintenance of grid connections during council works
	Increase # of grid connection offers, without discriminating
	Prioritise more competitive projects in ECP rounds
	Implement grid-following-funding for grid-connection offers, automatically guaranteeing grid connection for financially closed projects
	Facilitate private wiring for near-site opportunities
	Provide stronger incentives for ESBN / Eirgrid to deliver connections on time
LCOEs	Review business rates for projects with a view to lowering for new RE
	Scrap proposed noise limit policies that limit rotor tip height for onshore wind
	Extend accelerated capital allowance scheme to RE projects, reducing cost of capital and increasing capital recycling
	Establish low WACC green funds (e.g., WACC on par with German equivalent)
Market	Create carbon price floor or price support
	Allow trading of behind the meter assets e.g. rooftop solar into the grid
Pipeline	Create SEZs for new wind/solar projects and auction off sites to developers (similar to offshore)
	Remove planning permission for rooftop solar
Services	Ensure rapid development of storage and ICs required for high RE penetration scenarios

Contents

Recap: there are 4 requirements of a functioning corporate PPA market

Our appraisal considers how each option will address each step and how important each step is to different stakeholders

Baringa's 4 challenges to enabling Corporate PPAs

	CPPA Project pipeline	Value / price	Commercial risks	Procurement process
Description	***Ensuring supply**: the pool of projects seeking CPPAs as a route to market must be enough to meet the 15% target while facilitating competition for CPPAs*	***Ensuring demand**: the combination of price, additionality, traceability, price certainty and value that a CPPA offers for the large energy user*	***Managing risk**: the level of commercial, hedging and operational risks borne by each party must be acceptable to each party*	***Facilitating execution**: Simplifying and standardising contractual terms, as well as improving price discovery and market depth (i.e. liquidity) allows a broader base of end users capable of executing PPAs*

These 4 requirements form the first part of our qualitative appraisal of options: 'efficacy in enabling CPPAs'

Broader market enablers that should happen in parallel

CPPA-specific interventions are evaluated in this report, but the following underlying changes to the market will also be critical enablers of CPPA policy success, as well as the success of RESS

	What we assume will happen	Why this is critical for success of CPPAs
LCOEs	▲ The cost of renewables will come down as both technology costs fall and policies are put in place to minimise network and development cost	▲ LCOEs need to be competitive with wholesale prices in order to allow developers to offer strike prices at or below wholesale market prices to corporates or utilities / traders
Market	▲ Market structure and design will remain clear with no major structural changes that causes captured prices to undergo extreme pressure; range of traded markets and their liquidity will increase	▲ CPPA offtakers need assurance that contracts are unlikely to end up significantly 'out of the money' as a result of low wholesale prices ▲ Liquid, efficient traded markets, and greater options for both intra-day and forward trading allow risks to be managed
Pipeline / planning	▲ The overall pipeline of RE projects which have required planning permissions and grid connection offers is consistently fed and is well in excess of that required to deliver the 2030 target	▲ A healthy pipeline where there are winners and losers ensures both CPPA market and RESS auctions are competitive
Grid	▲ Grid connection offers are fulfilled on time and changes to grid infrastructure required to accommodate the 70 by 30 target are made in a timely manner and do not roadblock projects	▲ Keeps pipeline of projects seeking corporate PPAs healthy and removes commercial risk associated with late project delivery from contracting process
Services	▲ Functioning markets (with strong deployment of new technologies) for grid balancing services, storage, and market coupling emerge at pace to underpin both physical grid stability and wholesale price stability	▲ Perception and reality of price risk and curtailment risk is managed and allows easier approval of CPPA deals within organisations

Full list of qualitative appraisal metrics

Broader DECC goals, in particular the overall level of subsidy support for RE, as well as stakeholder support, uncertainty and risk were considered

Metric	Topic	Questions to be considered
Efficacy in enabling CPPAs	CPPA project pipeline	Does it increase the pipeline of projects in the market searching for CPPAs?
	CPPA economics	Does it improve the value of CPPAs to prospective parties?
	CPPA commercial risks	Does it help manage/remove commercial risks/barriers associated with a CPPA?
	CPPA procurement	Does it speed up or lower the cost of the procurement process for CPPAs?
Impact on DECC goals	Socialised RE cost	To what extent does the intervention reduce the total socialised cost of meeting 70 by 30? What does the intervention cost to fund? How is the PSO burden affected?
	Short term efficacy	Will the policy enable CPPAs in between RESS 1 and RESS 2?
	Community participation	How will it affect the likelihood of projects being endorsed by local communities?
	Technology diversity	How will it affect the penetration of solar PV into the RE mix? How will it affect the penetration of offshore wind into the RE mix?
Support from stakeholders	Support from Citizens	To what extent are costs / benefits distributed in a way that is undesirable to Government or unpopular with the public?
	Support from wider industry	To what extent will it enjoy support from other market actors (traders, suppliers, network operators)?
	Support from LEUs	What (if any) is the cost increase / reduction to private sector energy users? Does it unduly favour some users over others?
	Support from Generators	Does it unduly favour larger or smaller developers? Incumbent or new developers?
	Support from Government	How does it affect other government policies (enacted or publicly proposed)?
Complexity, uncertainty and execution risk	Complexity of integration into market design	How complex is the intervention to design? How difficult is it to deliver successfully? Are there competencies required deliver successfully? Does it require changes in market design? Are there existing mechanisms to achieve it? Does it require primary legislation?
	Risk of mis-specifying parameters	What is the risk of mis-specifying parameters? How sensitive is the intervention to changes in technology costs? What is the resultant risk of windfall profits or deadweight costs?
	Uncertainty of costs	What is the relative level of uncertainty on costs?
	Uncertainty of deployment	How complicated is the policy for actors to understand and what effect will this have on adoption? What is the relative level of uncertainty on adoption of CPPAs? and subsequent penetration of RE? How predictable is the effect on auctions?
	Scope for further appraisal	Is it easy to build up more of an evidence base for further appraisal?
	Ability to monitor and assess	Is it easy to monitor? Does it give clear signals that the policy is working / not working?
	Flexibility / ability to tweak	Is it easy and quick to tweak or pivot towards something similar if the policy is evidently failing? Or is there a high risk of scrapping and re-designing?

Scoring for qualitative appraisal

We have developed a qualitative 'traffic light' scoring scheme for each of the key metrics to compare the costs and effects of interventions

Metric	Efficacy in enabling CPPAs				Impact on DECC goals	Support from stakeholders	Complexity, uncertainty and execution risk
	CPPA pipeline of available and interested projects	CPPA economics / price	CPPA commercial risks (credit, downside, tenor)	CPPA procurement (speed, cost of procurement, complexity)	Socialised cost, community involvement, tech diversity	Generators, LEUs, other business, citizens, suppliers	Market integration, parameter specification, cost/adoption uncertainty
Scoring							
	Significantly reduces pipeline actively seeking	*Significantly worsens price / value of projects actively seeking*	*Significantly increase risk*	*Significantly raises barrier to execution*	*Certainly and substantially raises socialised cost of meeting targets*	*Likely to face strong resistance*	*Very difficult to implement and execute correctly*
	Modestly reduces pipeline of projects actively seeking	*Modestly worsens price / value of projects actively seeking*	*Modestly increases risk*	*Modestly raises barrier to execution*	*May raise socialised cost of meeting targets*	*Chance of resistance among key groups if not messaged properly*	*Some implementation challenges; further appraisal required*
	No (or very limited) effect					*Limited / neutral response*	*Simple, clear and low risk*
	Modestly improves pipeline actively seeking	*Modestly improves price / value of projects actively seeking*	*Modestly reduces risk*	*Modestly lowers barrier to execution*	*May reduce socialised cost of meeting targets*	*Should enjoy support among some key groups*	
	Significantly improves pipeline actively seeking	*Significantly improves price / value of projects actively seeking*	*Significantly reduces risk*	*Significantly lowers barrier to execution*	*Significantly reduces socialised cost of meeting targets*	*Will enjoy widespread support*	
	Ineffective in the short term but can be deployed later to target the second wave of smaller, less experienced energy users						

Contents

Summary of longlist assessment

Based on the results of our qualitative scoring of the longlist against our assessment criteria, we have placed the interventions into three groups

Candidates recommended for further appraisal

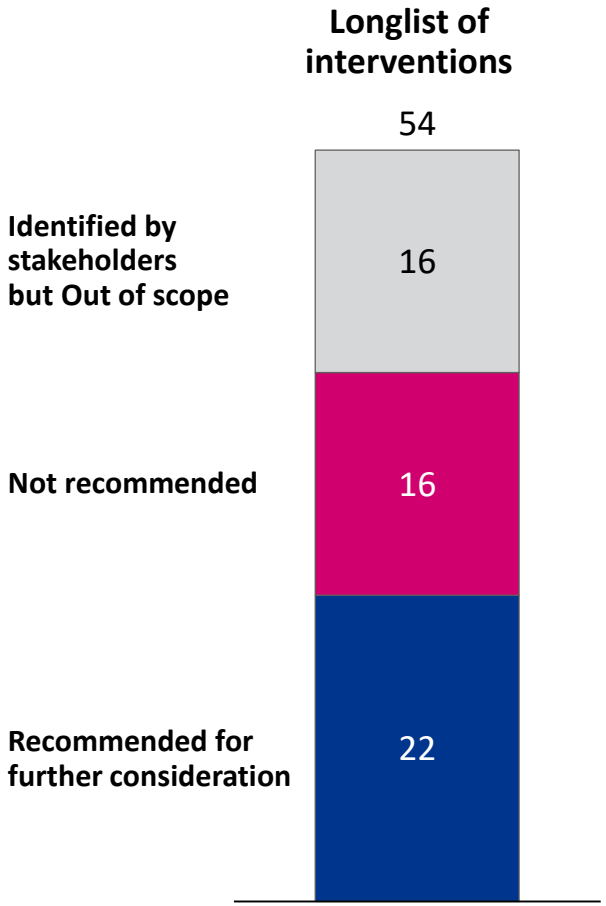
- Interventions which score highly in the qualitative assessment, and have the potential to begin making a material contribution in the first half of the 2020s
- Interventions which create a pipeline of competitive projects that need a CPPA to reach market
- Interventions which make the pipeline of projects more competitive by improving market fundamentals i.e. lowering development costs without providing subsidies

Not recommended for further consideration

- Interventions which score poorly in one or more areas of the qualitative assessment, such that there is a clear blocker to deployment, or a clear lack of merit in the near term
- Interventions which simply provide a large degree of subsidy outside the RESS auction and which are likely to result in material net end consumer costs
- Interventions which our assessment and / or stakeholder feedback have suggested will be ineffective in their primary purpose

Identified in feedback but out of scope

- Interventions which would positively impact the development of CPPAs but which are out of the scope of this policy action due to being addressable through other actions in the Climate Action Plan that have remit beyond CPPAs



Recommended for consideration in forming policy options

21 of the policies longlisted appear to be feasible and worthy of further analysis on effectiveness, costs and benefits

Focus	#	Intervention	Rationale for inclusion
Auction	1	Cap capacity eligible for RESS	Creates supply
	2	RESS tail auction	Creates supply, removes credit risk and price risk
	3	Leave price exposure in RESS (floor or inverse floor)	Creates supply, removes price risk
	4	Reduce RESS clearing volume	Creates supply
	5	Reduce RESS auction frequency	Creates supply
Developer	7	Fast-track grid connection offers for otherwise ready projects	Creates supply
	8	Facilitate direct wire for CPPAs	Creates demand
	10	Reduce business rates for CPPA projects	Creates demand
	11	Grid follows funding for CPPA projects	Creates supply
End user / supplier	15	Offer tax incentives for CPPAs	Improves pricing
	16	RESS-specific PSO exemption for CPPAs	Improves pricing
	18	Close supplier-lite option	Creates demand
	23	Mandate GoO / enhanced fuel mix disclosure among LEUs	Creates demand
	24	Mandate LEUs to procure GoOs from Irish merchant RE	Creates demand
	25	Mandate LEUs to procure CPPAs from Irish RE	Creates demand
	26	Mandate public sector demand for CPPAs	Creates demand
	27	Mandate suppliers to procure unsubsidised GoOs	Creates demand
Market making	32	Price floor guarantee on CPPAs	Improves pricing, removes price risk
	35	3rd party default guarantee on CPPAs	Removes credit risk
Peripheral	36	Provide a community fund for CPPA projects	Builds community support
	37	Mandate community principles for merchant projects	Builds community support
	38	Mandate community fund payment by developer/offtaker CPPA projects	Builds community support

Not recommended

18 of the policies longlisted are either likely to be insufficiently effective under any scenario or have major barriers to implementation

Focus	#	Intervention	Rationale for exclusion	Consider in future if targeting S/MEUs?
Auction	6	Open RESS to private buyers	Not likely to be materially effective	
Developer	9	Fixed premium per MWh on CPPAs	Inefficient and would not meet state aid rules	
	12	Lower network costs for close-proximity CPPAs	Too complex to design and implement	
	13	Delay grid offer bonding costs	Not likely to be materially effective	
	14	Reduce network costs for CPPAs	Too complex to design and implement	
Offtaker	17	Full PSO exemption for CPPA holders	Dilutes aims of PSO policy	
	19	Mandate public works ECP to procure CPPAs	Not likely to be materially effective and highly disruptive to sector	
	20	Subsidise community project CPPAs	Not likely to be materially effective	
	21	Basis risk protection for foreign offtakers	Complex; not likely to be materially effective	
	22	Support anchoring of SEUs and LEUs in CPPAs	Not timely, requires larger market of larger users first	✓
Market making	31	Create a CPPA exchange	Complex; not likely to be materially effective	✓
	33	Sell off REFiT exposure	Not likely to be materially effective	
	34	Govt. acts as single buyer and seller of CPPAs	Complex and over-reliant on state intervention; too similar to RESS	
Supplier	28	Subsidies for imbalance costs on CPPA volumes	Complex and not likely to be materially effective	
	29	Additionality accreditation + mandate	Not timely, consider for future targeting of S/MEUs	✓
	30	Additionality accreditation + premium	Not timely, consider for future targeting of S/MEUs	✓

Feasibility and channel for recommended interventions

Some interventions are easily achievable through current mechanisms, others likely to require primary legislation and/or more development to assess feasibility

#	Intervention	Existing policy initiatives	Policy pathway
1	Cap capacity eligible for RESS	Climate Action Plan Action 28 (RESS)	May be enacted within existing mechanisms
2	RESS tail auction	Climate Action Plan Action 28 (RESS)	New RESS High Level Design required
3	Leave price exposure in RESS (floor or inverse floor)	Climate Action Plan Action 28 (RESS)	New RESS High Level Design required
4	Reduce RESS clearing volume	Climate Action Plan Action 28 (RESS)	May be enacted within existing mechanisms
5	Reduce RESS auction frequency	Climate Action Plan Action 28 (RESS)	May be enacted within existing mechanisms
7	Fast-track grid connection offers for otherwise ready projects	Climate Action Plan Actions 17,19 & 23	ECP2 and further
8	Facilitate direct wire for CPPAs	Climate Action Plan Action 22	Pending separate steering group input
10	Reduce business rates for CPPA projects	*none*	Requires support from Valuation Office
11	Grid follows funding for CPPA projects	Climate Action Plan Actions 17,19 & 23	Currently in CRU discussion but not part of ECP2 consultation
15	Offer tax incentives for CPPAs	*none*	New RESS High Level Design required
16	RESS-specific PSO exemption for CPPAs	*none*	May be enacted within existing mechanisms
18	Close supplier-lite option	*none*	May be enacted within existing mechanism
23	Mandate GoO / enhanced fuel mix disclosure among LEUs	*none*	Primary legislation may be required
24	Mandate LEUs to procure GoOs from Irish merchant RE	Climate Action Plan Actions 20,37	Primary legislation may be required
25	Mandate LEUs to procure CPPAs from Irish RE	Climate Action Plan Actions 20,37	Primary legislation may be required
26	Mandate public sector demand for CPPAs	*none*	May be enacted within existing mechanisms
27	Mandate suppliers to procure unsubsidised GoOs	*none*	Primary legislation may be required
32	Price floor guarantee on CPPAs	Climate Action Plan Action 28 (RESS)	May be enacted within existing mechanisms but requires state aid notification
35	3rd party default guarantee on CPPAs	*none*	Further assessment of a working model required
36	Provide a community fund for CPPA projects	*none*	May be enacted within existing mechanisms
37	Mandate community principles for merchant projects	*none*	Primary legislation may be required
38	Mandate community fund payment by developer/offtaker CPPA projects	*none*	Primary legislation may be required

Relative cost of interventions

Some interventions are easily achievable through current mechanism, others require primary legislation and/or more development to assess feasibility

		Cost		
#	Intervention	To industry	To public / consumers	To design / implement
1	Cap capacity eligible for RESS	Disruptive – may increase cost	Carries risk of higher auction prices	Complex to design
2	RESS tail auction	Disruptive – may increase cost	Carries risk of higher auction prices	Complex to design
3	Leave price exposure in RESS (floor or inverse floor)	Disruptive – may increase cost	Carries risk of higher auction prices	Further design / analysis required
4	Reduce RESS clearing volume	Disruptive – may increase cost	May increase cost of RESS	Relatively simple
5	Reduce RESS auction frequency	Disruptive – may increase cost	May increase cost of RESS	Relatively simple
7	Fast-track grid connection offers for otherwise ready projects	Cost reducing to developer	May increase cost of RESS	Further design / analysis required
8	Facilitate direct wire for CPPAs	Cost reducing to developer	High uncertainty over cost required	Further design / analysis required
10	Reduce business rates for CPPA projects	Cost reducing to developer	Requires redistribution of tax base	Further design / analysis required
11	Grid follows funding for CPPA projects	Cost reducing to developer	May increase network costs	Complex to design
15	Offer tax incentives for CPPAs	Cost reducing to LEU	Requires redistribution of tax base	Further design / analysis required
16	RESS-specific PSO exemption for CPPAs	Cost reducing to LEU	Significant if power prices decline	Relatively simple
18	Close supplier-lite option	Modest additional cost on LEU	No additional cost to consumers	Relatively simple
23	Mandate GoO / enhanced fuel mix disclosure among LEUs	Modest additional cost on LEU	No additional cost to consumers	Relatively simple
24	Mandate LEUs to procure GoOs from Irish merchant RE	Cost additive to LEU	No additional cost to consumers	Further design / analysis required
25	Mandate LEUs to procure CPPAs from Irish RE	Cost additive to LEU	No additional cost to consumers	Complex to design
26	Mandate public sector demand for CPPAs	Neutral	Cost additive to public sector energy costs	Further design / analysis required
27	Mandate suppliers to procure unsubsidised GoOs	Cost additive to LEU	No additional cost to consumers	Further design / analysis required
32	Price floor guarantee on CPPAs	Cost reducing, shared	May be costly depending on uptake	Complex to design
35	3rd party default guarantee on CPPAs	Cost reducing, shared	Should be material but not exposed to power price movements	Complex to design
36	Provide a community fund for CPPA projects	Cost reducing, shared	Significant, guaranteed cost	Relatively simple
37	Mandate community principles for merchant projects	Neutral	No additional cost to consumers	Relatively simple
38	Mandate community fund payment by developer/offtaker CPPA projects	Cost additive, shared	No additional cost to consumers	Relatively simple

We have qualitatively assessed the cost of shortlisted interventions

Public cost to fund and to implement have been considered, as has cost to absorb by industry where applicable

Cost to industry	Cost to public / consumers	Cost to design / implement
Is the cost of doing business likely to increase significantly as a result of the intervention	*Is the cost to consumers via the PSO or other taxes / levies likely to increase as a result of the intervention*	*Is there significant design and implementation effort involved and /or significant risk around not designing the policy correctly*

Contents

Structure of this section

This section is intended to assist policymakers through addressing the following questions:

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  - How do interventions integrate with different types of offtaker?

Strategic decisions

- What, if any, unavoidable choices are faced in designing effective policy
- What are the implications and trade-offs associated with these choices?
- How do individual interventions lean towards choosing one way or another?

Linking interventions

- How does each intervention interact with other possible interventions?
  - Are interventions additive, complimentary, either/or by nature?

Policy packages

- What are some example policy packages based on feasible interventions, which address the required actions?
- What optionality exists within the policy packages?
- Are policy packages more suited to a specific technology type or timeframe?

We have identified 7 actions of a comprehensive policy suite

Baringa

Based on feedback and evaluation, we think a comprehensive set of interventions for Ireland will address the project pipeline, demand, pricing, credit risk, price risk, and public support

Project pipeline seeking CPPAs	Value / price	Commercial risks	Procurement process
#1 **Support supply** by removing the conflict with RESS	#2 **Support demand** through imperatives to procure green power among LEUs	#4 **Reduce credit-risk** developers, offtakers and lenders associated with CPPAs	#6 Induce market makers (e.g., suppliers) to **facilitate procurement** among smaller, less sophisticated energy users
	#3 **Improve pricing** by improving the financial attractiveness for LEUs entering into a CPPAs	#5 **Reduce long-term price risk:** Bridge gap between longer **tenor** required by developers vs maximum acceptable to offtakers	#7 **Achieve community support** for any new projects backed by CPPAs

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Where is CPPA demand currently more primed?

DC owners are generally more primed for CPPAs than other large energy users as they are actively seeking PPAs, and are often more able to manage commercial risks and procurement hurdles

	CPPA Project pipeline	Value / price	Commercial risks	Procurement process
Data Centres	Some actively engaged parties seeking additional CPPAs	Value additionality and traceability but require pricing to be close to wholesale pricing	Capable of taking 10 – 15 year tenors, generally owned by credit worthy organisations	Often bring experience of executing CPPAs in other jurisdictions
Other private large energy users	Bar a few exceptions, not yet actively seeking CPPAs		Typically not able to take 10 – 15 year tenors	Dedicated energy procurement personnel but limited experience of procuring PPAs
Public sector as a user	Bar a few exceptions, not yet actively seeking CPPAs	Currently focused on price alone		

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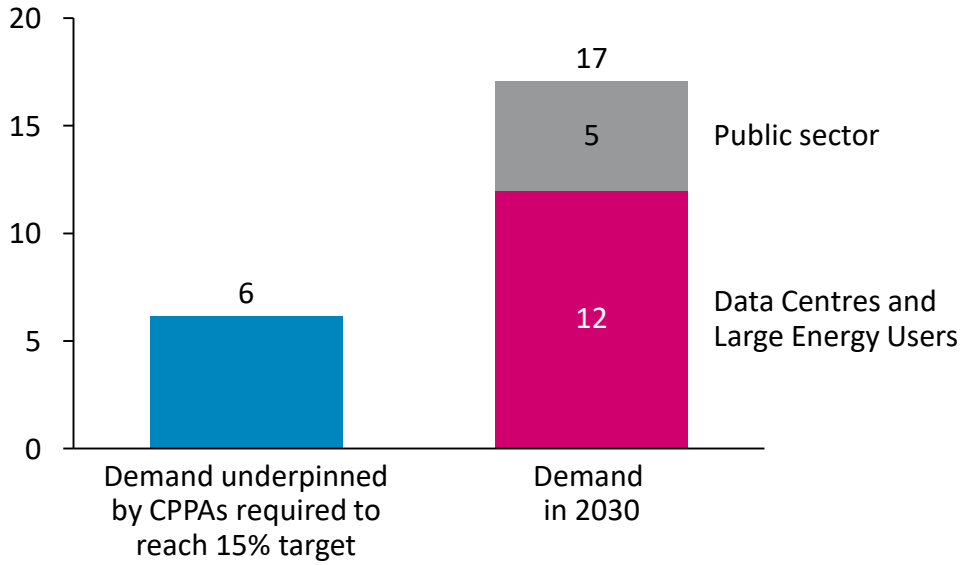
CPPA demand volumes by segment

Projected data centre energy requirements alone are in excess of the 15% CPPA target by 2030, however over-reliance on DCs carries risk and should be avoided

Figures are preliminary

Corporate PPA target demand vs target demand base in RoI

TWh per annum in 2030*



Reasons to be cautious about over-reliance on DCs

- There may **be resistance to contracting 100% of electricity demand** from long-term CPPAs, as it may be seen as an overly risky
- In many cases there is significant optionality around the location of future European data centres – **future demand is not necessarily tied to Ireland** and could migrate elsewhere
- The policy is **exposed to the success / failure of one sector of the economy** alone, rather than being distributed across a variety of sectors, and is therefore vulnerable to Ireland's performance in that sector
- Focusing solely on DCs may **miss the broader opportunity to unlock the value in green electricity** held by other segments of the market

DCs are obvious candidates for CPPAs, but reforms to unlock broader large energy user base should be pursued to minimise risk and maximise opportunity to leverage wider corporate demand for green energy

Source: Eirgrid 2019-28 All-Island Generation Capacity Statement

Note: * Data centre demand based on 2028 Eirgrid median scenario; public sector demand assumed flat relative to today

Where is project supply currently more primed?

Larger onshore wind projects are more primed for CPPAs than other technologies as they are currently more cost competitive

	CPPA Project pipeline	Value / price	Commercial risks	Procurement process
Large-site onshore wind developers	Pipeline limited by conflict with RESS, with CPPAs being sought primarily as a means of reducing reliance on RESS and making pipeline less cyclical	Potentially competitive, provided larger turbines can be deployed	Delivery risk and need for long term tenors are shared across all technology types	Some experience among developers across all technology types
Small-site onshore wind developers		Currently less competitive		
Solar developers		Lack of price discovery to date in Ireland – largest solar projects may be competitive		
Offshore wind developers	No pipeline for near-term delivery		Regulatory risk – auction participation required	Limited offtakers of required size for large scale offshore wind

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Potential CPPA supply volumes by technology

The volume of CPPAs required implies a need to engage a range of renewable generation technologies

GW capacity required under CPPAs

Technology	Typical load factor	6 TWh Equivalent capacity	Status of pipeline	Baringa assumptions on deployment
Onshore wind	35%	2.0 GW	• c.500 MW with planning permission at scale capable of competing for CPPAs • 4 GW likely to reach full consent by 2030 under current policy environment	• Between 1.5 and 2.5 GW additional capacity deployed in total by 2030 • Potential for more near-term weighting towards CPPAs given the mature nature of technology in Ireland relative to others
Offshore wind	45%	1.6 GW	• 4 GW of capacity across 6 projects capable of being deployed (consented or likely to be consented) by 2030	• Around 1.5 GW additional capacity deployed in total by 2030 • More weighted towards RESS given project scale and need for industry development
Solar	11%	6.4 GW	• c.1 GW with connection offers • A further 5GW pipeline of greenfield projects	• Between 1 and 2 GW additional capacity deployed in total by 2030 • Potential for even distribution between RESS and CPPAs in the medium / long-term

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Source: KPMG, Press articles

Illustrative CPPA deployment strategy

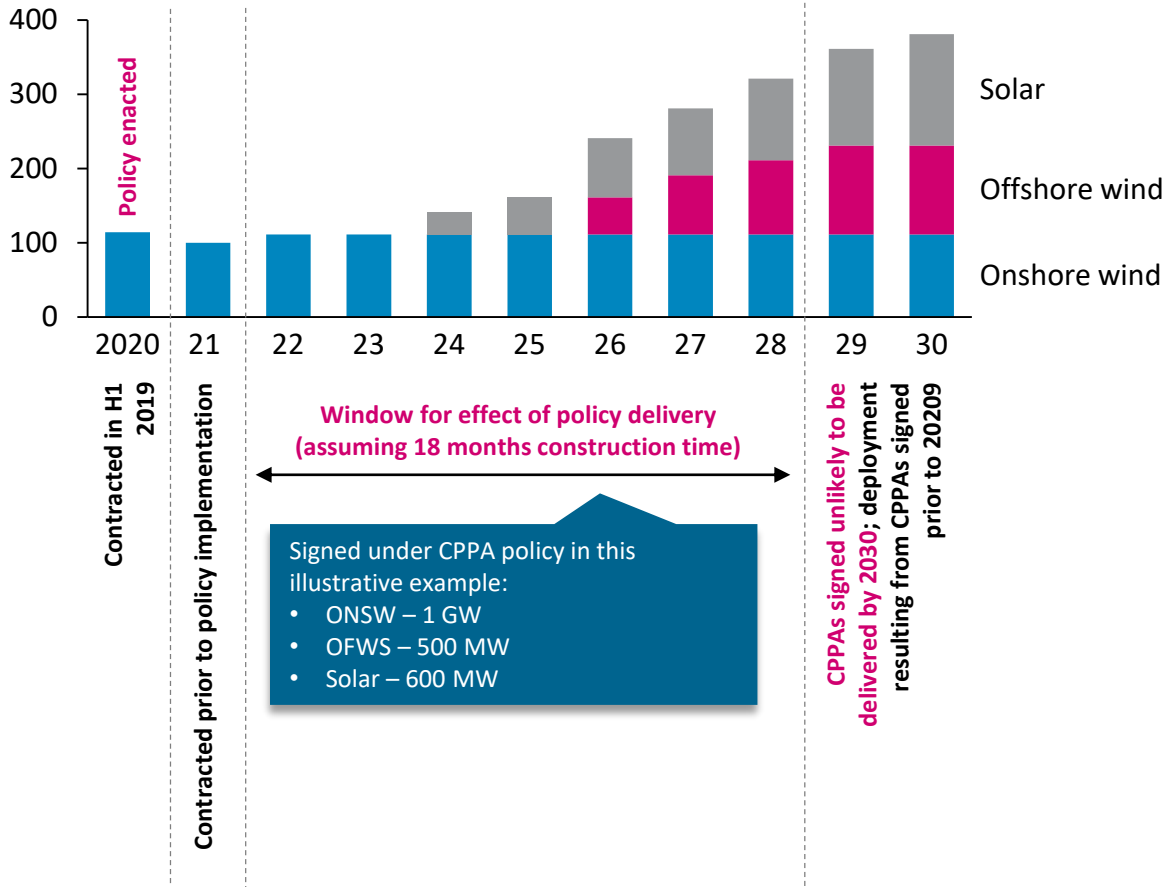
Focus on unlocking onshore CPPAs in the near term – offshore wind and solar becoming more competitive over time, leading to more CPPA deployment in the latter half of the 2020s

Illustrative technology deployment under CPPA

- Onshore wind is currently more competitive and should therefore dominate near term deployment of CPPA-enabled capacity
- Potential for longer-term deployment is even across all technologies as LCOEs for solar and offshore wind should fall
- This is likely to result in CPPA enabled deployment being weighted towards the latter half of the decade
- Offshore wind is particularly challenging, as projects are
  - Often too large to find a route to market via a single CPPA
  - Small in number, and therefore ensuring competition remains high requires careful management
- To manage this risk, one approach for government may be to:
  - Focus on **accelerating the onshore wind pipeline** to bring forward deployment
  - Adopt a **phased approach to policy implementation**, focusing on releasing pent up demand in the short term, while taking steps to broadening the market in the medium term

Figures are illustrative

Deployment of 6 TWh of CPPA-enabled capacity
MW installed



Potential phased CPPA policy approach

Immediate steps to unlocking CPPAs among some large energy users immediately could be followed by steps to broaden the base of demand in a potential 'second phase'

Phase 1 of enabling corporate PPAs – enact now

- #1 **Ensure demand**: remove the conflict with RESS to unlock the pipeline
- #2 **Ensure supply** through combination of mandates ad improvements in traceability
- #3 Incentives that facilitate more attractive CPPA **pricing**
- #4 Reduce **credit-risk** associated with CPPAs
- #7 Ensure **community support**

Gets credible, competitive projects away to credible offtakers who are already in the market

Focus on improving market fundamentals in broader set of '70 by 30' actions

- A Ensure healthy pipeline with appropriate levels of competition
- B Measures to lower LCOEs
- C More forward liquidity in traded markets

Phase 2 of enabling corporate PPAs - enact by end of 2023

Continuation of actions

#1 #2 #3 #4 #7

and in addition…

- #5 **Reduce price risk** Bridge gap between longer tenor required by developers vs maximum acceptable to offtakers
- #6 Induce suppliers into market to **facilitate procurement** among smaller, less sophisticated energy users

Expands the pool of credible offtakers as falling technology costs and other improvements to market fundamentals begin to expand market of credible projects

Actions | Strategy | Linking | Packages

Mapping of shortlist of interventions against actions that they address

		1	2	3	4	5	6	7
#	Intervention	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community
1	Cap capacity eligible for RESS	✓	x	x	x	x	x	x
2	RESS tail auction	✓	x	✓	✓	✓	✓	x
3	Leave price exposure in RESS (floor or inverse floor)	✓	x	✓	x	✓	x	x
4	Reduce RESS clearing volume	✓	x	✓	x	x	x	x
5	Reduce RESS auction frequency	✓	x	x	x	x	x	x
7	Fast-track grid connection offers for otherwise ready projects	✓	x	✓	x	x	x	x
8	Facilitate direct wire for CPPAs	x	x	✓	x	x	x	x
10	Reduce business rates for CPPA projects	x	x	✓	x	x	x	x
11	Grid follows funding for CPPA projects	✓	x	0	x	x	x	x
15	Offer tax incentives for CPPAs	x	x	✓	x	x	x	x
16	RESS-specific PSO exemption for CPPAs	x	x	✓	x	x	x	x
18	Close supplier-lite option	x	✓	x	x	x	x	x
23	Mandate GoO / enhanced fuel mix disclosure among LEUs	x	✓	x	x	x	x	x
24	Mandate LEUs to procure GoOs from Irish merchant RE	x	✓	✓	x	x	x	x
25	Mandate LEUs to procure CPPAs from Irish RE	x	✓	✓	x	x	x	x
26	Mandate public sector demand for CPPAs	x	✓	✓	x	x	x	x
27	Mandate suppliers to procure unsubsidised GoOs	x	✓	✓	x	x	x	x
32	Price floor guarantee on CPPAs	x	x	✓	✓	✓	x	x
35	3rd party default guarantee on CPPAs	x	x	x	✓	x	x	x
36	Provide a community fund for CPPA projects	x	x	x	x	x	x	✓
37	Mandate community principles for merchant projects	x	x	x	x	x	x	✓
38	Mandate community fund payment by developer/offtaker CPPA projects	x	x	x	x	x	x	✓

Contents

Recap: structure of this section

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  - How do interventions integrate with different types of offtaker?

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- What, if any, unavoidable choices are faced in designing effective policy
- What are the implications and trade-offs associated with these choices?
- How do individual interventions lean towards choosing one way or another?

Linking interventions

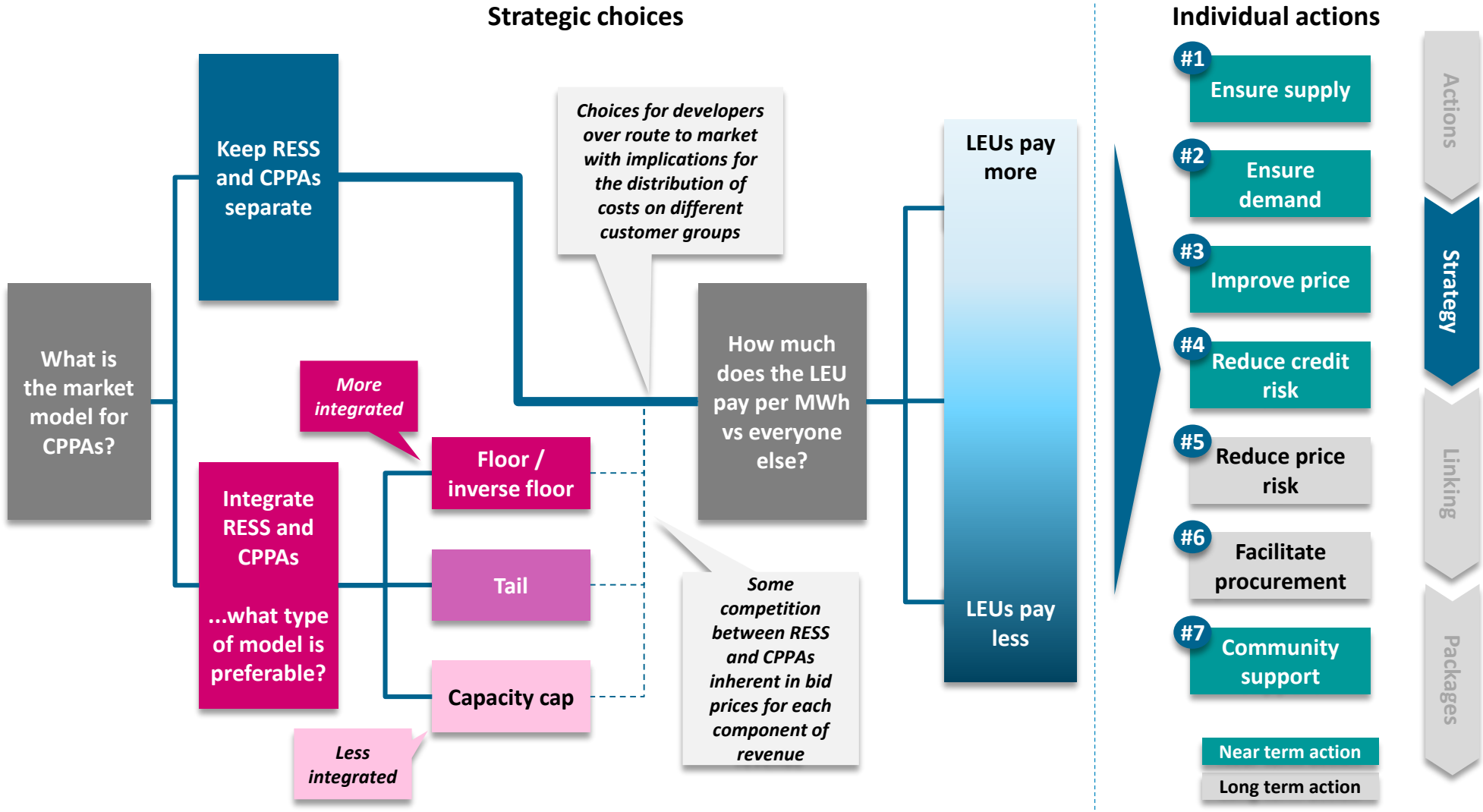
- How does each intervention interact with other possible interventions?
  - Are interventions additive, complimentary, either/or by nature?

Policy packages

- What are some example policy package based on feasible interventions, which takes the required actions and what strategic direction does it imply?
- What optionality exists within that package?
- Is such a package more suited to a specific technology type or timeframe?

Strategic choices implicit in developing policy options

There are two key strategic choices for government to make on market model and allocation of cost between RESS and CPPAs



Strategic question #1: which market model to use

Government has a choice between keeping RESS and CPPA separate or integrating them such that projects could combine multiple routes to market

Should RESS be separate or integrated?

Separate

Implications

- ✚ Requires very little change to current market design
- ✚ Keeps RESS limited in size**, reducing operational risk on DECC** in facilitating deployment
- ✚ **Clearer additionality** associated with CPPAs
- ▬ There will **always be tension / competition between RESS and the CPPA** market,
  - Relative to an integrated model, **this forces a more explicit policy choice** on whether CPPA offtakers should pay more or less than the broader PSO base as policy determines where the 'best' projects go
- ▬ May require **change of law for offshore wind** projects to go ahead with CPPAs without participation in RESS as currently RESS participation is mandated in leasing/consenting process

Key policy options

- ▲ Reduce RESS auction frequency
- ▲ Reduce RESS auction clearing volume
- ▲ Make connection offers for CPPA projects further ahead of RESS

Integrated

Implications

- ▬ Requires a deliberate change in market design
- ✚ Broadens merchant-exposure beyond CPPAs, **allowing more flexibility in optimising the correct model for taking on merchant exposure** within each project.
- ✚ Potential for some models to **address credit and price risk barriers**
- ✚ Can (in some models) **stimulate more liquidity in traded forward markets**, improving operation of SEM
- ▬ Places most or all of the volume required for '70 by 30' into RESS – **more operational risk on DECC** in facilitating deployment
- ▬ CPPAs may be **challenging to close until post-auction**, may slow down time to reach financial close in some cases
- ▬ Unclear whether CPPAs stacked on government contracts **are sufficiently additional** for corporates
- ▬ **Risk of inflated RESS prices** if CPPAs cannot be procured prior to financial close

Key policy options

- ▲ Change RESS design to allow potential 'stacking' of CPPA and RESS revenues

✚ Pro ▬ Con

These are either / or choices – the continuation of current RESS design equates to keeping markets separate

Summary of options for integrating RESS and CPPAs

There are three potential integrated-market approaches, as a floor and inverse-floor structure produce similar outcomes

Should RESS be separate or integrated?

	Design	Revenue stacking model
Capacity eligibility cap	▲ RESS offers a two way CfD for a limited portion of the project's capacity	▲ A PPA can raise the MW amount under a fixed price contract ▲ The proposition to the offtaker is the same as in a non-integrated market
Tail auction	▲ RESS offers a two-way CfD (as per current design) but for the latter period of project's lifetime e.g., years 5 to 15	▲ An auction contract for years 5 to 15 can follow a PPA procured with a supplier or large energy user for the first 5 years, giving the project the required 15 years of fixed revenue ▲ Option for developer to take merchant risk on first 5 years
Floor (one-way CfD)	▲ RESS offers a one-way CfD, protecting the developer against lower prices but giving exposure to higher prices ▲ Contract similar to REFiT but competitive process prompts bidding at levels lower than total fixed revenue stream required	▲ A PPA can raise the level of guaranteed revenue for the project above the floor ▲ The floor allows the project to offer the offtaker protection against the risk of low wholesale prices via an inverse floor
Inverse floor auction	▲ RESS offers a one-way CfD that offers the developer a fixed strike price but leaves exposure to lower prices ▲ Structure currently in use in Netherlands subsidy scheme	▲ A cap-and-floor CPPA can protect the project against the risk of the payment cap kicking in at low prices ▲ The floor allows the project to offer the offtaker protection against the risk of low wholesale prices via an inverse floor ▲ The CPPA gives the offtaker a hedge against extreme prices – protecting against high prices in exchange for setting a lower limit on prices

Some minor difference in pros/cons but broadly similar outcomes

Actions | **Strategy** | Linking | Packages

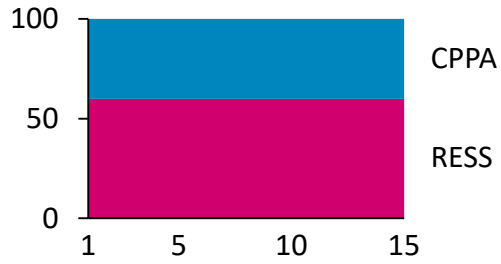
Auction revenue stacking explained

How each contract stacks to give the developer a fixed price over a 15 year period

Should RESS be separate or integrated?

Capacity cap

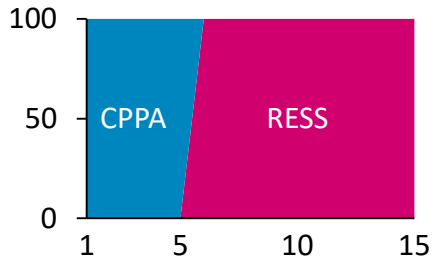
Share of MW capacity contracted on project



- CPPA MWs and RESS MWs are separate,
- Contracts run in parallel

Tail auction

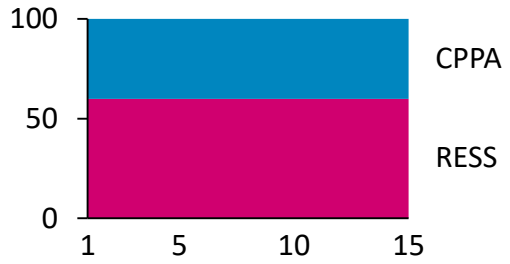
Share of MW capacity contracted on project



- CPPA MWs and RESS MWs are the same but MWhs are separate
- Contracts are sequential, RESS kicks in once CPPA expires

Floor / inverse floor

Share of MWh revenue on project



- Each MWh associated with both RESS and CPPA
- Contracts run in parallel

Mapping of individual interventions to market models

Some interventions are applicable across a range of policy scenarios, others are more suited to specific scenarios

		Should RESS be separate or integrated?			
	Shortlisted intervention	**Keep separate**	**Floor auction**	**Tail auction**	**Capacity Cap**
1	Cap capacity eligible for RESS	x	x	x	✓
2	RESS tail auction	x	x	✓	x
3	Leave price exposure in RESS (floor or inverse floor)	x	✓	x	x
4	Reduce RESS clearing volume	✓	x	x	x
6	Reduce RESS auction frequency	✓	x	x	x
7	Fast-track grid connection offers for otherwise ready projects	✓	x	x	x
8	Facilitate direct wire for CPPAs	✓	✓	✓	✓
10	Reduce business rates for CPPA projects	✓	✓	✓	✓
11	Grid follows funding for CPPA projects	✓	x	x	x
15	Offer tax incentives for CPPAs	✓	✓	✓	✓
16	RESS-specific PSO exemption for CPPAs	✓	✓	✓	✓
18	Close supplier-lite option	✓	✓	✓	✓
23	Mandate GoO / enhanced fuel mix disclosure among LEUs	✓	✓	✓	✓
24	Mandate LEUs to procure GoOs from Irish merchant RE	✓	✓	✓	✓
25	Mandate LEUs to procure CPPAs from Irish RE	✓	✓	✓	✓
26	Mandate public sector demand for CPPAs	✓	✓	✓	✓
27	Mandate suppliers to procure unsubsidised GoOs	✓	✓	✓	✓
32	Price floor guarantee on CPPAs	✓	x	x	✓
35	3rd party default guarantee on CPPAs	✓	x	x	✓
36	Provide a community fund for CPPA projects	✓	✓	✓	✓
37	Mandate community principles for merchant projects	✓	✓	✓	✓
38	Mandate community fund payment by developer/offtaker CPPA projects	✓	✓	✓	✓

Summary of merits of each market model

Baringa

Should RESS be separate or integrated?

	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Merits
Keep separate	✓							• Requires very little change to current market design • Keeps RESS limited in size**, reducing operational risk on DECC** in facilitating deployment • **Strong additionality**
Capacity eligibility cap	✓							• Lightest integration approach, keeps RESS MW and CPPA MW separate, **strongest additionality** of the integrated options
Tail auction	✓	✓	✓	✓	✓	✓		• Lighter integration than floor mechanisms, keeps RESS MWh and CPPA MWh separate, stronger additionality as a result • Reduces tenor required for CPPAs, thereby **reducing both credit risk and tenor risk** and **broadening market** beyond DCs as a result • **Should stimulate suppliers/ traders** to participate as offtakers due to reduced tenor – liquidity should increase • **Opportunity for government to sell off tail contracts** if they are in-the-money
Floor / inverse floor auction	✓	✓	✓		✓		✓	• **If floor**: reduces the risk of offtakers missing out on lower prices, therefore more will be willing to sign up for 15 year PPAs • **If inverse floor**: provides a hedge against extreme prices to the offtaker while still leaving exposure to moderate prices • **Has precedent** in REFiT scheme (floor) and NL subsidy model (inverse floor) • May **broaden demand base** through removal of price risk

Summary of drawbacks of each market model

Baringa

Should RESS be separate or integrated?

	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Drawbacks / risks
Keep separate	✓							• More explicit **competition between CPPA** offtakers and **RESS** • **Risk of inflated RESS prices** if more competitive projects seek infra-marginal rent through auction • **Other interventions requires to remove price risk**, may reduce number of willing offtakers • **Other interventions requires to remove credit risk**, may reduce the number of bankable offtakers
Capacity eligibility cap	✓							• **Operational risk for DECC** in relying on RESS for all volumes • **Risk of inflated RESS prices** if CPPA /merchant market demand/liquidity is poor • **Price risk barrier remains**, may reduce number of willing offtakers • **Credit risk barrier remains**, may reduce the number of bankable offtakers
Tail auction	✓	✓	✓	✓	✓	✓		• **Operational risk for DECC** in relying on RESS for all volumes • **No precedent** exists elsewhere, more detailed design needed, including mechanism / strategy for holding or selling off auction contracts closer to delivery (i.e. 3 – 4 years in to contract) • **Weaker in terms of additionality**, especially if many projects go merchant on first 5 years
Floor / inverse floor auction	✓	✓	✓		✓		✓	• **Operational risk for DECC** in relying on RESS for all volumes • **Risk of inflated RESS prices** if CPPA /merchant market demand/liquidity is poor • **Weakest in terms of additionality**, especially if floor is high enough for many projects to start going merchant • Fundamentally **de-values GoOs**, assuming they are all are released

Actions | **Strategy** | Linking | Packages

Summary of interventions which are complimentary to each market model

Should RESS be separate or integrated?

	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Other complimentary interventions
Keep separate	✓							• Reduce RESS auction frequency • Reduce RESS auction clearing volume • Make connection offers available for better projects further ahead of RESS
Capacity eligibility cap	✓							• Credit guarantee or CPPA-specific floor price guarantee to alleviate credit risk and price risk • Mandate procurement (if desired) among LEUs or suppliers • Provide PSO rebates / tax incentives to encourage offtakers • Continue to withhold GoOs associated with auction MW • Community support policy on MWs outside of auction
Tail auction	✓	✓	✓	✓	✓	✓		• Continue to withhold GoOs associated with auction MWh and Auction off GoOs and / or MWhs prior to beginning of tail if of value • Mandate procurement (if desired), among LEUs or suppliers • Community support policy on MWh outside of auction
Floor / inverse floor auction	✓	✓	✓		✓		✓	• Credit guarantee to alleviate credit risk • Mandate publication of GoOs and release GoOs to developers in auction contracts* • Mandate procurement (if desired), among LEUs or supplier • Maintain community fund contribution policy on MWh auctioned in RESS

Actions | Strategy | Linking | Packages

Note: *Release of GoOs is not listed in shortlist as it is only applicable to the floor auction structure. All other structures should continue to withhold GoOs associated with auctioned MWhs to reduce risk of greenwashing using RESS-supported GoOs

More detailed analysis is required if an integrated model is to be considered

- Versus the current model, how much risk is there in missing…
  - the RESS portion of 70 by 30 target?
  - The CPPA portion of 70 by 30 target?
- What is the downside risk involved and how probable is it? i.e. risk of missing target by considerable distance?

Risk of missing 70 by 30 target

Government's market risk appetite

- How much would a new model increase MW deployed per MWh contracted by Government?
- Where is the appropriate cut-off point of any specified parameters for a given level of risk appetite? E.g.,
  - 5 year tail auction or 6 year?
  - 50% capacity cap or 70%
- Does this cut-off still allow the model to work properly? E.g., can it be a 10 year tail auction or a 5 year?

Cost to consumers

- What is the overall PSO cost of the new model and how does this affect the PSO burden per user?
- Are there other external costs generated on / removed from consumers by the new model?
  - E.g., are there market efficiencies from generating market liquidity in a tail auction?

Strategic question #2: what do LEUs pay proportionally

Many interventions change how much LEUs pay proportionally per MWh of renewable power vs other consumers – it is important to make a conscious and informed decision about this trade-off

Do LEUs pay more or less than everyone else?

Target model of LEUs paying more

Implications

- ✚ Makes mandating demand feasible and therefore **de-risks** likelihood of **targets not being met**
- ✚ **Reduces overall burden of PSO** by reducing levy attributable to RESS, thereby reducing risk of loss of public support for 2030 targets
- ▬ Increases risk that mandated CPPAs are purchased above wholesale prices. This in turn may cause:
  - Reduce Ireland's **attractiveness to foreign direct investment** in energy intensive sectors
  - Increase the **likelihood of LEUs pursuing legal options** in any mandate rather than accepting it

Key policy options

- ▲ Mandate CPPAs among LEUs
- ▲ Mandate minimum quantity of GoOs among LEUs
- ▲ Provide incentives to LEUs that help achieve better pricing (tax, PSO, business rates)

Target model of LEUs paying less

Implications

- ▢ Implies avoiding interventions aimed at offering **price incentives** or **mandates on CPPA procurement** to be introduced, as these will artificially increase prices
- ▢ Implies a focus on **risk-reducing incentives** aimed at facilitating CPPAs, but which may require further cost socialisation (on PSO or LEUs) as these will reduce prices by warehousing risk
- ✚ **Leverages existing demand** among LEUs for CPPAs with projects that are i) comparable or below with wholesale prices and that ii) otherwise **might achieve infra-marginal rent** in RESS
- ▬ Risk of **reducing public support** for both 2030 targets and for large energy users if they are perceived to be benefiting from policy

Key policy options

- ▲ Fast-track consent of more competitive projects, increasing time-lag to RESS
- ▲ Warehouse price risk and credit risk away from individual CPPA contracts

▢ Neutral ✚ Pro ▬ Con

These represent two extremes of a spectrum and government could attempt to pursue a hybrid approach by mixing mandates and incentives

Effect of interventions that change what LEUs pay

Some interventions may have reasonably predictable effects upon how much LEUs must pay for renewable power, while others are less predictable without further detailed analysis

		Do LEUs pay more or less than everyone else?
		What effects might this have?
Example intervention	**Effect on cost of CPPAs to LEUs**	**Description**
Reduce business rates for developers entering into CPPAs	**More predictable**	• *Lowers the overall cost of a project which has secured a CPPA* • *Benefit likely to feed back into a **reduced strike price** for a CPPA, provided developers do not have market power*
Mandate CPPAs among LEUs	**Less predictable**	• *Assuming static supply and demand, a mandate would **increase CPPA strike prices** by creating additional demand, which projects that were previously not competitive enough to participate would fill* • *However, a mandate may substantially shift supply by sending a signal that a certain market size is guaranteed, causing more supply to pursue CPPAs. This may in turn **decrease the strike price** achievable.*
3rd party guarantee on credit risk	**Less predictable**	• *A guarantee against credit default should **decrease the strike price** that is acceptable by developers who should benefit from a lower cost of capital as a result of the credit guarantee* • *However, the cost of providing the guarantee may be socialised among LEUs and/or developers and it is not clear at this point whether a net benefit would feed through to CPPA strike prices, or whether **strike prices would increase***

Contents

Recap: structure of this section

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Actions required to increase PPA activity

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- What is the timeliness of each action?
  - How do interventions integrate with the development of each technology?
  - How do interventions integrate with different types of offtaker?

Strategic decisions

- What, if any, unavoidable choices are faced in designing effective policy
- What are the implications and trade-offs associated with these choices?
- How do individual interventions lean towards choosing one way or another?

Linking interventions

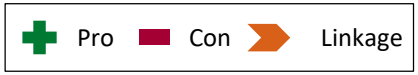
- How does each intervention interact with other possible interventions?
  - Are interventions additive, complimentary, either/or by nature?

Policy packages

- What are some example policy package based on feasible interventions, which takes the required actions and what strategic direction does it imply?
- What optionality exists within that package?
- Is such a package more suited to a specific technology type or timeframe?

We have produced a detailed matrix of the relationships between individual interventions

Classification of relationship	Description	Example
A - Additive	Each has same effect but do not cannibalise each other	*PSO exemption + Business rates reduction*
C - Complimentary	Each addresses different issues	*Mandate CPPA procurement + PSO exemption*
X - Cannibalistic	Each combined somewhat reduces the efficacy of the other due to overlapping objectives which are not additive	*PSO exemption + Community Fund contribution*
E/I - Either / or	Avoid combining both, each radically reduces the case for the other	*RESS Tail auction + RESS Floor auction*



Options to address priority actions

#1 Ensuring supply (segregated market only)

#	Intervention option	Intention	Assessment	Relative pros and cons, linkages, other considerations
4	**Reduce RESS clearing volume**	*Allow private entities to contract in the RESS auction using RESS contract T&Cs, thereby allowing private buyers to benefit from the process infrastructure provided by the auction. Private buyers could accept / compete for bids not accepted by RESS.*	*Recommended for further consideration*	Steers a higher proportion of projects away from RESS towards CPPAs RESS still likely to retain the best projects, few CPPAs offering value to LEUs vs wholesale prices in the near term Pairing with a mandate approach would lower risk of poor demand, guaranteeing a market for the set of projects which do not offer value vs wholesale prices
5	**Reduce RESS auction frequency**	*Shifts more projects away from RESS and into the CPPA market, making the CPPA market more competitive and lowering the burden of RESS*	*Recommended for further consideration*	Easy to implement Already signs in the market that better projects have been seeking CPPAs to remove developers' reliance on RESS May improve market confidence in RESS timings if occurring less frequently Steers a higher proportion of projects away from RESS towards CPPAs
7	**Fast-track connection offers for more otherwise ready projects**	*Creates a gap between being shovel ready and RESS auctions for projects that are more likely to seek out CPPAs due to being more competitive, thereby increasing propensity to seek a CPPA*	*Recommended for further consideration*	May enjoy market broad support, connection offer timeliness perceived as a blocker Steers more competitive projects away from RESS towards CPPAs Could be paired with reduction in auction frequency to ensure a sizeable gap between connection offer and RESS
11	**Grid follows funding for CPPA projects**	*Provide extra incentive to seek out CPPAs before considering RESS by shortening the project development timeline*	*Recommended for further consideration*	May enjoy market broad support, connection offer timeliness perceived as a blocker Further consultation required with LEUs to assess whether CPPAs could be signed under a guaranteed-grid scheme May prove costly to consumers if part of funding is socialised Steers more competitive projects away from RESS towards CPPAs

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#2 Ensuring demand (1 of 2)

#	Inter-vention option	Intention	Assessment	Pros, cons, linkages, other considerations
18	**Close supplier-lite option**	*Make it impossible for users to claim traceability by setting up supplier-lite entities that achieve a 100% fuel mix disclosure by off-taking from subsidized generators, thereby making CPPAs the only alternative to achieving traceability*	*Recommended for further consideration*	✚ Likely to enjoy broad support ✚ Appears feasible i.e. not overly complex to design and implement ➤ Compliments mandating GoO disclosure among LEUs ➤ Workable under any of the 4 market models
23	**Mandate GoO / enhanced fuel mix disclosure among LEUs**	*Creates demand for CPPAs as a means of providing traceability by putting more social pressure on LEUs to achieve traceability*	*Recommended for further consideration*	✚ Reduces complexity of proving traceability in CPPAs ✚ Likely to enjoy broad support ✚ Appears feasible i.e. not overly complex to design and implement ➤ Compliments closing supplier-lite option ➤ Workable under any of the 4 market models ■ May require support from suppliers to provide data required for disclosure
26	**Mandate public sector to procure CPPAs from Irish RE**	*Forces organisations with large energy footprint that are funded by state to sign additionality-seeking power products (PPAs or otherwise) or face penalties*	*Recommended for further consideration*	✚ Pubic sector bodies are credit worthy off-takers with relatively stable energy usage profile, similar to data centres in suitability for CPPAs ■ Requires careful timing if implemented - most effective where a shortfall of private sector demand has created a buyers market, may be costly to government if implemented in a sellers market as pricing may be higher ■ Requires capability building to procure PPAs within public sector and careful alignment with EU rules on public procurement

Actions | Strategy | **Linking** | Packages

✚ Pro ▬ Con ➤ Linkage ■ Other consideration

Options to address priority actions

#2 Ensuring demand (2 of 2)

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
24	**Mandate LEUs to procure GoOs from Irish merchant RE**	*Keeps burden on LEUs to underpin merchant RE but does not force them into long-term PPAs, leaving the optimal solution to be determined by the market*	*Recommended for further consideration*	+ Avoids need to strictly define CPPAs and allows scope for some alternative route to market structures to emerge → Likely to be the more effective than a CPPA-specific-mandate in a floor model or a tail-auction model where shorter term PPAs may be attractive to developers − Requires an excess of ready supply over demand to be maintained in order to avoid excessive price rises from developer market power
25	**Mandate LEUs to procure CPPAs from Irish RE**	*Forces organisations to sign additionality-seeking power products (PPAs or otherwise) or face penalties*	*Recommended for further consideration*	− Complex to design - requires careful definition of CPPAs to avoid options appearing and unintended consequences → May be more effective than a broader GoO mandate in a segregated or (to a lesser extent) a capacity-cap model, where price risk from long tenors are still a barrier to LEU willingness to enter into CPPAs + Lowest risk option for ensuring LEUs are providing real additionality − Requires an excess of ready supply over demand to be maintained in order to avoid excessive price rises from developer market power
27	**Mandate suppliers to procure GoOs from Irish merchant RE**	*Adds a premium to the value of renewable power but keeps generators exposed to market prices and leaves suppliers with task of optimising who pays (LEUs, SMEs, homeowners). More market-based than mandating LEUs as suppliers are required to solve for who values the GoOs more. Worst case scenario, any additional cost is passed onto all customers*	*Recommended for further consideration*	− May cause disruption in supplier sector, forcing suppliers to take on long term price risk. This may limit the number of supplier participants in the market in the long run → May work best in a tail auction model where there is less long term price risk owned by the private sector but suppliers turn out to be slow to respond to the new market model + Suppliers are, in theory, natural owners for developing products / propositions for realising demand for green energy − Requires an excess of ready supply over demand to be maintained in order to avoid excessive price rises from developer market power

+ Pro − Con → Linkage ■ Other consideration

Actions | Strategy | Linking | Packages

Options to address priority actions

#3 Interventions that specifically target **improved pricing**

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
8	**Facilitate direct wire for CPPAs**	*Increases pipeline of projects seeking a CPPA. Further analysis required on what measures are possible by relevant policy group*	*Recommended for further consideration*	Needs further investigation by appropriate policy group to determine mechanism Opportunity primarily resides with LEUs outside of DCs – therefore addressing price risk also important in making this effective
10	**Reduce business rates for CPPA projects**	*Lowers the project LCOEs which can be passed through to CPPA strike prices*	*Recommended for further consideration*	May obtain more support among public vs other incentives as business rates currently seen as unfairly weighted towards legacy generation (incl. fossil fuels) Will steer projects towards CPPAs and away from RESS in a segregated market May be Less appropriate for an integrated market model as all developers already steered towards CPPAs. LEUs benefit from reduced prices but incentive is not theirs to act on
15	**Tax incentives for CPPAs**	*Same effect as removing the PSO levy but with different branding*	*Recommended for further consideration*	Will steer projects towards CPPAs and away from RESS in a segregated market Workable in either segregated or integrated market as the incentive targets LEUs, not developers
16	**RESS PSO exemption for CPPAs**	*Remove or reduce the levy that corporates pay to support renewables development, improving the economic attractiveness of PPAs for corporates*	*Recommended for further consideration*	May be acceptable to consumers as CPPAs reduce the RESS burden Will steer projects towards CPPAs and away from RESS in a segregated market Workable in either segregated or integrated market as incentive targets LEUs, not developers
17	**Full PSO exemption for CPPAs**	*Remove or reduce the levy that corporates pay to support renewables development, improving the economic attractiveness of PPAs for corporates*	*Not recommended*	May not be acceptable to consumers as legacy REFiT PSO burden is exempted Will steer projects towards CPPAs and away from RESS in a segregated market Workable in either segregated or integrated market as incentive targets LEUs, not developers

Pro | Con | Linkage | Other consideration

Actions | Strategy | Linking | Packages

Options to address priority actions

#3 Interventions that target other barriers as well as **improve pricing**

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
2	**RESS tail auction**	*Increases pipeline of projects seeking a CPPA. Further analysis required on what measures are possible by relevant policy group*	*Recommended for further consideration*	Integrated market model Improves pricing by removing some long term price risk and credit risk via shorter tenors required - should therefore be value additive; not value substitutive
3	**Leave price exposure in RESS (floor auction)**	*Lowers the project LCOEs which can be passed through to CPPA strike prices*	*Recommended for further consideration*	Integrated market model Improves pricing by removing some long term price risk by allowing the developer to offer price risk mgmt. within the CPPA pricing structure
6	**Reduce RESS clearing volume**	*Same effect as removing the PSO levy but with different branding*	*Recommended for further consideration*	Increases chances of LEUs getting a more competitive project that can offer lower prices Will steer some projects that are not competitive enough for RESS towards CPPAs, not required in an integrated market
7	**Fast-track connection offers for more otherwise ready projects**	*Creates a gap between being shovel ready and RESS auctions for projects that are more likely to seek out CPPAs due to being more competitive, thereby increasing propensity to seek a CPPA*	*Recommended for further consideration*	Increases probability of more competitive projects that can offer lower prices seeking out CPPAs Will steer projects towards CPPAs and away from RESS in a segregated market, not required in an integrated market
32	**Offer price floor guarantee on CPPAs**	*Mitigates price risk for both sides by guaranteeing the generator a floor price, which in turn can guarantee the off-taker exposure to prices below the floor*	*Recommended for further consideration*	Improves pricing by removing some long term price risk by allowing the developer to offer price risk mgmt. within the CPPA pricing structure May not be permissible under EU law without an auction process Compatible with a segregated model or a capacity cap model where long term price risk remains

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#4 Managing credit risk

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
2	**RESS tail auction**	*Creates a market for 5 year fixed-price PPAs by offering generators some revenue certainty on years 5+, leaving a gap between revenue guaranteed from RESS and level of guaranteed revenue required to reach financial close*	*Recommended for further consideration*	Integrated market model Removes credit risk by reducing tenor to level acceptable by both lenders and CFOs - should therefore be value additive; not value substitutive
34	**Govt. acts as single buyer and seller of CPPAs**	*Similar to tail auction in its intention to remove tenor mismatch but does not put onus on developer to find CPPA to reach financial close*	*Not recommended*	Can remove credit risk and price risk in a segregated market model Makes Government an influential market participant with market power, counter to intentions of creation of SEM. May require action through a non-government agency Requires new auction design in addition to RESS
35	**Offer 3rd party default guarantee on CPPAs**	*Warehouses credit risk associated with default of either party. Cost of warehousing may be socialised either among intended beneficiaries or more broadly*	*Recommended for further consideration*	Can remove credit risk in a segregated market model Has precedent in Norway - efficacy can be more closely studied May require action through non-Government agency as Government guarantee similar to Norway not compliant with EU law Socialises risk that individual organisations struggle to own, should therefore be value additive rather than value substitutive

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#7 Community support

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
36	**Govt. provides community fund for CPPA projects**	*Offer parity in value to community of PPA backed projects versus RES backed projects*	*Recommended for further consideration*	Ensures community support policy is neutral with respect to competition between RESS and CPPAs in a segregated model Highest cost to Government of maintaining community support Steers projects away from RESS towards CPPAs as relative price will be improved Could be applied to a separated or integrated model Applies to some extent by default in an integrated model, although community fund may only be on MWh contracted to Government Could be mandated for CPPA MWs in a capacity cap model or MWhs in a tail auction model if support is required on top of RESS community support
37	**Mandate community principles for merchant projects**	*Offer parity in value to community of PPA backed projects versus RES backed project*	*Recommended for further consideration*	Steers projects away from RESS towards CPPAs as relative price will be improved Risk that projects may not get community support, despite best efforts of LEUs May be more successful for technologies enjoying more community support (e.g., offshore wind) Could be applied to a separated or integrated model
38	**Mandate CPPA projects to provide community fund**	*Offer parity in value to community of PPA backed projects versus RES backed project, but with a positive PR message for corporates*	*Recommended for further consideration*	Ensures community support policy is neutral with respect to competition between RESS and CPPAs in a segregated model Counteracts / negates any incentives offered to LEUs to improve pricing Could be applied to a separated or integrated model Could be mandated for CPPA MWs in a capacity cap model or MWhs in a tail auction model if support is required on top of RESS community support

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#5 Managing price risk

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
2	**RESS tail auction**	*Creates a market for 5 year fixed-price PPAs by offering generators some revenue certainty on years 5+, leaving a gap between revenue guaranteed from RESS and level of guaranteed revenue required to reach financial close*	*Recommended for further consideration*	Integrated market model Removes price risk by reducing tenor to level acceptable by both lenders and CFOs, should therefore be value additive; not value substitutive
3	**Leave price exposure in RESS (floor auction)**	*Signals to the market that the RESS auction is supposed to be a floor upon which a further PPA with a corporate or utility can be utilised to further stack guarantee revenues*	*Recommended for further consideration*	Integrated market model Improves long term price risk by allowing the developer to offer price risk mgmt. within the CPPA
32	**Offer price floor guarantee on CPPAs**	*Mitigates price risk for both sides by guaranteeing the generator a floor price, which in turn can guarantee the off-taker exposure to prices below the floor. If PPA @ 50, floor 30, prices @ 25, then Gov pays 5 to gen which gets passed on to offtaker*	*Recommended for further consideration*	Improves price by warehousing risk - should therefore be value additive; not value substitutive May not be permissible under EU law without auction process Can remove credit risk in a segregated market model
34	**Govt. acts as single buyer and seller of CPPAs**	*Similar to tail auction in its intention to remove tenor mismatch but does not put onus on developer to find CPPA to reach financial close*	*Not recommended*	Removes price risk by reducing tenor to level acceptable by both lenders and CFOs, should therefore be value additive; not value substitutive Can remove credit risk and price risk in a segregated market model Makes Government an influential market participant with market power, counter to intentions of creation of SEM Requires new auction design in addition to RESS

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#6 Options specifically targeted at **facilitating procurement**

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
22	**Support anchoring of SEUs and LEUs in CPPAs**	*Expands potential reach of CPPAs to users not able to run procurement on their own.*	*Not recommended for immediate consideration*	Feedback suggests LEU CPPAs typically bespoke terms, therefore terms unlikely to suit smaller users May act as a barrier / distraction to increasing LEU involvement in the near term
29	**Additionality accreditation + mandate**	*Forces suppliers to make the market by creating standardised CPPA products*	*Not recommended for immediate consideration*	Assumed suppliers are able to take long term price risk, only appropriate to a tail auction or floor auction but questionable over whether necessary in either case, price risk removal itself should sufficiently incentivise supplier involvement More workable where price risk is removed but LEUs may reject 'additionality' of merchant power e.g., tail auction, floor auction
30	**Additionality accreditation + premium**	*Encourages suppliers to take on CPPAs (incl. risk) which qualify for the additionality credit and which can then be disaggregated among customer base*	*Not recommended for immediate consideration*	May require material public burden to fund premium to an extent that is required to get suppliers involved in taking price risk
31	**Create a CPPA exchange**	*Reduces execution and procurement barriers to PPAs for users willing to accept the standard terms*	*Not recommended for immediate consideration*	Avoids risk of supplier market failing to facilitate procurement Assumes a set of standardised CPPA terms will be accepted by market – this is not guaranteed

Pro Con Linkage Other consideration

Actions Strategy Linking Packages

Options to address priority actions

#6 Options targeting other areas which are also **facilitating procurement**

#	Intervention option	Intention	Assessment	Pros, cons, linkages, other considerations
2	**RESS tail auction**	*Creates a market for 5 year fixed-price PPAs by offering generators some revenue certainty on years 5+, leaving a gap between revenue guaranteed from RESS and level of guaranteed revenue required to reach financial close*	*Recommended for further consideration*	Integrated market model Encourages suppliers into market by removing credit and price risk, creating more forward liquidity up to 5 years
3	**Mandate suppliers to procure GoOs from Irish merchant RE**	*Adds a premium to the value of renewable power but keeps generators exposed to market prices and leaves suppliers with task of optimising who pays (LEUs, SMEs, homeowners). More market-based than mandating LEUs as suppliers are required to solve for who values the GoOs more. Worst case scenario, any additional cost is passed onto all customers*	*Recommended for further consideration*	May cause disruption in supplier sector, forcing suppliers to take on long term price risk. This may limit the number of supplier participants in the market in the long run May work best in a tail auction model where there is less long term price risk owned by the private sector but suppliers turn out to be slow to respond to the new market model Suppliers are, in theory, should be natural owners for developing products / propositions for realising demand for green energy

Pro | Con | Linkage | Other consideration

Contents

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  - How do interventions integrate with different types of offtaker?

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- What are the implications and trade-offs associated with these choices?
- How do individual interventions lean towards choosing one way or another?

Linking interventions

- How does each intervention interact with other possible interventions?
  - Are interventions additive, complimentary, either/or by nature?

Policy packages

- What are some example policy package based on feasible interventions, which takes the required actions and what strategic direction does it imply?
- What optionality exists within that package?
- Is such a package more suited to a specific technology type or timeframe?

Example Package 1 | Segregated markets, enhanced LEU access to pipeline

Segragate markets, enhanced LEU access to pipeline	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
Fast-track connection offers for more otherwise ready projects		✓						Core
Reduce RESS auction frequency	✓							Core
Close the supplier-lite option		✓						Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Mandate community principles for merchant projects							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
3rd party acts as guarantor in case of default		✓		✓				Optional
Mandate public sector demand		✓						Optional
Floor guarantee on CPPAs					✓	✓		Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- Interventions which create a time lag for more competitive projects between being shovel ready and RESS
- Enhanced GoO / fuel mix disclosure publication and closure of supplier-lite option to encourage LEUs who are slow to pursue projects

Potential variations

- PSO rebate and / or mandate to procure can be introduced if price marginally prohibitive
- Public sector mandate or a floor guarantee can plug any demand gap that is foreseeable if data centre LEU market is exhausted
- Credit guarantee may increase size of data centre market beyond global tech giants to more specialist players

Technology and timing perspective

- Will work immediately for onshore wind if acted upon in time for ECP2
- May require cost to fall for solar before being effective
- Not appropriate for offshore wind due to requirement to auction offshore wind capacity and farms requiring multiple CPPAs to fill capacity

Example Package 2 | Segregated market, mandate driven approach

Segregate markets, LEUs pay more	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
Mandate LEUs to procure GoOs or CPPAs from Irish merchant RE		✓						Core
Reduce RESS frequency and / or clearing volume	✓		✓					Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
3rd party default guarantee on CPPAs				✓				Optional
Floor guarantee on CPPAs					✓	✓		Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- Mandate that ensures demand, combines with some control over RESS timings and volumes to ensure adequate supply (but without a focus on steering most competitive projects towards CPPAs)
- Closure of supplier-lite option reduces risk of loop-holing mandate
- LEUs pay for community fund

Potential variations

- Incentives can be introduced if CPPA prices become too inflated
- Credit and price risk guarantees can be introduced if mandate is to be extended beyond data centres

Technology and timing perspective

- May be most effective option where costs do not fall fast enough in line with wholesale prices e.g., solar
- Equally may be more desirable where costs are consistently below wholesale prices (e.g., Baringa High Commodities scenario) and LEUs therefore still getting value despite paying more than RESS

Example Package 3 | Tail auction

Tail auction	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
RESS tail auction	✓	✓	✓	✓	✓	✓		Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
Mandate suppliers or LEUs to procure GoOs from Irish merchant RE		✓						Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- A RESS auction which leaves the first 5 years uncontracted for the market to fill in
- Enhanced GoO publication / fuel mix disclosure, and closure of supplier-lite option, to encourage LEUs who are slow to pursue projects

Potential variations

- Mandate on suppliers or LEUs to procure if lack of demand is preventing projects taking off even with RESS contracts

Technology and timing perspective

- May provide a means of offshore wind securing CPPAs while still going through RESS
- Also workable for onshore wind and solar
- May be more appropriate for RESS 3 – 4: lack of precedent presents risk, may benefit from further design taking into account
  - RESS 1 learnings
  - evolution of CPPA market over next 2 – 3 years learnings –

Example Package 4 | Floor auction

Floor auction	Supply	Demand	Price	Credit risk	Price risk	Procurement	Community	Role in package
RESS floor auction	✓	✓	✓		✓			Core
Mandate enhanced GoO / fuel mix disclosure among LEUs		✓						Core
Close the supplier-lite option		✓						Core
Mandate CPPA projects to provide community fund							✓	Core
RESS PSO rebate and/or tax incentives			✓					Optional
Mandate suppliers or LEUs to procure GoOs from Irish merchant RE		✓						Optional
3rd party acts as guarantor in case of default		✓		✓				Optional
Total	✓	✓	✓	✓	✓	✓	✓	

Core components

- A RESS auction which provides a price floor as a 'backstop' but leaves generators exposed to market price risk above this level
- Enhanced GoO publication / fuel mix disclosure, and closure of supplier-lite option, to encourage LEUs who are slow to pursue projects

Potential variations

- Mandate on suppliers or LEUs to procure if lack of demand is preventing projects taking off even with RESS contracts
- Default guarantee may be introduced if credit risk is still proving to be a barrier

Technology and timing perspective

- May provide a means of offshore wind securing CPPAs while still going through RESS
- Also workable for onshore wind and solar
- May be more appropriate for RESS 2 or beyond: may benefit from further design taking into account
  - RESS 1 learnings
  - Further study of the Netherlands model