Investments for the Energy Transition

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Interesting Facts

Climate Target for 2020 – Historical Figures

- EU greenhouse gas emissions were **reduced by 24% between 1990 and 2019**, while the economy grew by around 60% over the same period.
- From 2018 to 2019, emissions declined by 3.7%.
- The most significant decline was in sectors covered by the EU ETS, in particular power plants. Emissions from stationary installations in all countries covered by the system fell sharply by 9.1% between 2018 and 2019.
- Emissions not covered by the ETS (such as emissions from non-ETS industry, transport, buildings, agriculture and waste) remained unchanged between 2018 and 2019. The year before, these emissions had seen a slight drop; however, overall, emissions from this aggregate of economic sectors have been stable for several years.
- CO_2 emissions from international aviation continued to increase in 2019, rising by 3% compared to the previous year, continuing the increasing trend. Aviation emissions are covered by the ETS, but currently only for flights within the European Economic Area (EEA).

Global Emissions (50 bln tCO2e)			%
Energy	Energy in Industry	12.1	24.2%
	out of which Iron&Steel	3.6	*7.2%*
	Energy in Transport	8.1	16.2%
	out of which Road	5.95	*11.9%*
	Energy Buildings	8.75	17.5%
	Fossil Fuel Extraction	2.9	5.8%
	Other energy use	4.75	9.5%
Industry	Cement Production	1.5	3.0%
	Chemicals&Petrochemicals	1.1	2.2%
Waste	Wastewater	0.65	1.3%
	Landfills	0.95	1.9%
Agriculture	Agriculture	9.2	18.4%
	out of which Livestock	2.9	5.8%
TOTAL		50	100.0%

Global Emissions Fuel Type (bln tCO2e)	
Coal	14.4
Oil	12.4
Gas	7.6
TOTAL	34.3

Content :

Political Context – a global ambition

Green Deal – climate neutrality until 2050

EU Climate Law (amended proposal for EU Regulation submitted by European Commission to the European Parliament, the European Council etc. on 17.09.2020)

- legally binding target of **net zero greenhouse gas emissions by 2050**.
- **new EU target for 2030** of reducing GHG emissions by at least **55%** compared to levels in 1990 vs. current obligation, as per Revised EU ETS Directive 2018/410 of **40%** (until 2019 the EU has reduced its GHG emissions by 24% vs. 20% target for 2020).
- adoption of **a 2030-2050 EU-wide trajectory** for GHG emission reductions,
- by September 2023, and every five years thereafter, the Commission will assess the consistency of EU and national measures with the climate-neutrality objective and the 2030-2050 trajectory and be empowered to issue recommendations to MS whose actions are inconsistent with the climate-neutrality objective, and Member States will be obliged to take due account of these recommendations or to explain their reasoning if they fail to do so.
- MS will also be required to develop and implement **adaptation strategies to strengthen resilience** and reduce vulnerability to the effects of climate change.

Also, the negotiating mandate adopted by the European Parliament in early October on the EU climate law also stipulated that:

- EU and member states must also **phase out all direct and indirect fossil fuel subsidies by 31 December 2025** at the latest
- rejecting the Commission's proposal to rely on carbon sinks like forests and grasslands to meet the 2030 climate target.
- EU objective for 2030 should rely only on domestic emission cuts (and not on carbon-cutting projects in developing countries.

Given energy production and use accounts for 75% of the EU's emissions, energy will continue to play a central role.

Bundesanslat fur Finanzdienstleistungsaufsicht defines **Sustainability Risk** as follows:
Sustainability risks are environmental, social or governance (ESG) events or conditions, which if they occur have or may potentially have significant negative impacts on the assets, financial and earnings situation, or reputation of a supervised entity. They are split in 2 main risks: physical risks and transition risks.

Interdependence of physical risks and transition risks.
A sharp increase in physical risks would require the economy to transition more rapidly, leading in turn to higher transition risks. If the required reduction in GHG emissions is not carried out in time, physical risks and the pressure for action will increase (in a extreme climate-induced damages as a result of long delays in energy transition could force a sudden and radical change in the economy

Romanian Market Context

Romanian Energy Market

Installed Power

MW	Net Power 2021	Net Power 2019
Coal	3,469	4,128
Gas/Oil	2,191	3,045
Hydro	6,311	6,318
Wind	2,965	2,977
Biomass	125	122
PV	1,296	1,298
Nuclear	1,300	1,300
Total	**17,658**	**19,188**
Base Load	7,086	8,595

Power Price and Imports

EUR/MWh	2019	2020	2021
PZU (RO)	53	40	
Term Market (RO)	50	52	50
PZU (SK)	42	34	

Hourly Imports (MW)	Max.	Ave.	Min.
2020	2,133	307	(1,771)
2019	1,934	167	(1,631)

High investments in gas infrastructure

High investments in gas infrastructure in the recent years for increasing interconnection capacity with Hungary, Bulgaria and Moldavia

New gas discoveries in the Black Sea

Investment Barriers for RES

- high grid connection costs (if at all possible),
- high balancing costs,
- inflexible trading instruments

Power Need

- max. 9443MW in 2019 and 9614MW in 2021
- ave. 6858MW in 2019
- min. 4485MW in 2019

Power price has been fully **liberalized** starting 01.2021

Offshore Law (2018) – new off-shore law expected in 2021 (apparently draft law already existing before elections)

Gas price has been **liberalized** starting 07.2020, incl. gas release program until 2022

However, PPAs for new investments are currently allowed, as per OUG 74/2020 (to be confirmed in the Parliament)

Romania 2030 Climate Change Action Plan

Romania submitted its final plan in April 2020, which provided the following inter alia:

- **2030** binding **43.9%** (vs. 21% in 2020) **target cut in GHG** compared to 2005 levels for Romania.
- **2030** binding **30.7%** (vs. 20% in 2020) target **renewable energy** in total gross energy consumption (intermediary targets of +1.2% in 2022, +2.9% in 2025 and +4.4% in 2027).
- **2030 14.2% target** in the **transportation fuels sector**, out of which a max. of 7% first generation biofuel from food crops and min. 1% second generation biofuel by 2025 and 3.5% by 2030) vs. 6.56% level at 2017
- **2030** binding **45.1%** (vs. 20% in 2020) **energy efficiency target** in total primary energy consumption vs. PRIMES forecast
- **2030 interconnection target of 15%** (10% target for 2020 – 9% reached)
- continue process of intra-day and day-ahead market coupling + demand response + storage capacities + prosumers
- proposed new investments: 2,300MW of wind and 3,700MW of solar
- gradual decommissioning of coal power plants from 3240MW currently to 1980MW in 2025, as per CE Oltenia Development and Decarbonisation Plan + 1400MW of new gas power replacing old coal plants in Tuceni, Rovinari and Isalnita + 300MW of PV plants
- Retechnologisation of existing 2*650MW nuclear reactors and development of 2 new reactors (each 675MW for 2030 and 2031)
- 600-700MW additional Transelectrica grid capacity
- implementation of BAT (best available techniques principle in industrial processes
- development of national gas transport system and facilitation of investments in the Black Sea's natural gas perimeters

According to the Commission's evaluation:

- it still lacks ambition, and it should allocate more financing to projects that contribute to the green transition.
- failed to notify the Commission of its national long-term strategy (LTS) (was in the meantime sent – status unkown)
- unambitious energy efficiency target (25.7 Mtep in 2030), considering the ave. final consumption in 2016-2018 (22.9 Mtep).
- policies and measures for the achievement of the decarbonisation objective need more clarity, incl. schedule, expected impact, necessary financial resources.
- failed to notify the Commission of its national long-term strategy (LTS), a document outlying how the country intends to reach the goal of carbon neutrality by 2050, as required under the NECP Governance Regulation.
- although several coal-fired power units are envisaged for replacement with gas-fired ones, a coal phase-out plan is still absent, and measures to phase out fossil fuel subsidies are still missing.

Current status: unknown. Moreover, targets will be revised upwards in 2023, as per new GHG target for 2030..

Romania 2030 Climate Change Action Plan

Tip sursă	Noi capacități producție (2021-2030)	Capacitate (Producție Energie Electrică MWe / Producție Energie Termică MWt)	SACET (MWe) (MWt)	Clienți industriali (MWe) (MWt)
Nuclear	CANDU	675		
Gaze naturale	CCGT	1.600 / -		
Gaze naturale	CHP	1.302 / 1.214	952 / 914	350 / 300
Hidro (firul apei/lac de acumulare)	Unități > 10MW	1.088		
SRE	Eolian	2.302		
SRE	Fotovoltaic	3.692		

Sursă: Calcule Deloitte pe baza informațiilor transmise de Grupul de lucru interinstituțional PNIESC și a recomandărilor COM

Sustainable Investments

Energy Sector Supply-chain

Consumption

- Renovation of building stock (MEUR 12,800 investments expected for 2030)
- Solar energy production (power and heat) for own consumption, especially PV for retailers and industrial producers
- Replacement of old inefficient industrial equipment
- Replacement of vehicle fleet to low-carbon fuels
- More efficient lightning solutions
- Modal shift of freight and/or passenger transport from road or air to rail or waterways
- Electrification of rail infrastructure and rolling stock
- Public low-carbon transportation or bikes for urban transport
- Carbon capture and storage systems

Transportation

- Retrofit of transmission lines or substations and/or distribution systems to reduce energy use and/or technical losses, especially in the thermal energy distribution networks

Production

- New and retechnologisation of renewable energy capacities (incl. biogas from organic waste and sludge) + new gas capacities as a substitute for old gas and coal power plants (new capacities require ≈MEUR 12,000 of investments, as per PNIESC 2030)
- District heating using combined heat and power plants
- Renewable or low-carbon hydrogen production plants (also as diversification strategy for single-fuel producers)
- Recovery and use of heat in power plants and vice-versa
- Carbon capture and storage systems

Resources

- Discovery and development of gas resources

PPAs

General Market Context

Regulation 943 (applicable starting 2020)**/ Directive 944** (to be transposed in national law until 31.12.2020)
- Elimination of regulated prices for the electricity market.
- Directly negotiated power purchase agreements concluded outside OPCOM centralized markets will once again be allowed.
- Long term PPAs may be concluded as early as of the development stage, once a technical connection permit is obtained.
- Large consumers can participate in wholesale market, as PPA counterparty

Green Deal
- PNIESC proposed new investments: 2,050MW of wind and 3,700MW of solar
- EU Strategy for Offshore Renewable Energy by the end of 2020 → from currently 20GW off-shore wind to 300-450GW until 2050
- EU Strategy for Renewable Hydrogen

Renewable Energy in Romania
- 5000MW of RES projects have been installed until 12.2016 – to be gradually refurbished starting the end of the GCs scheme

PPA price for no subsidy RES investment
- At a power price of 50-60 EUR/MWh wind and solar energy technologies no longer need support schemes to become economically viable investments in the EU, as a result of increased CO2 price and efficiency improvements/ decrease of technology cost for RES

CfD scheme
- Memorandum on the basic principals of a new CfD scheme for new RES, nuclear and battery capacities in Romania has been signed between the Ministry of Economy, ANRE and Competition Council
- Ministry currently runs a study with an independent consultant to evaluate options/ details for implementing the CfD scheme.
- Expected to be implemented in 2022-2023
- Transelectrica mentioned as possible CfD counterparty

District heating (update of Termoficare 2006-2020 strategy)
- With the help of a new co-generation bonus scheme or investment subsidies,

PPAs

Role of PPA

What is a PPA?
A Power Purchase Agreement (PPA) mainly refers to a long-term electricity supply agreement between two parties, usually between a power producer and a customer (an electricity consumer or suppliers). The PPA defines the conditions of the agreement, such as the amount of electricity to be supplied, negotiated prices, duration of the contract, balancing responsibilities, guarantees, termination clauses and penalties for non-compliance.

What is the role of PPAs?
Long-term Cash-flow predictability → Reduction of cash-flow volatility → Reduction of investment risk → helps investors secure helps long-term financing, incl. cheaper debt financing, such as project finance bank loans and bonds. In the context of the cheapening of RES technology and rise of EUA prices for conventional energy producers, some RES investors have decided to build new capacities without relying on any incentive scheme. Thus, in the context of the shift from regulatory risk to market risk, PPAs help reduce risk

How does the PPA generate cash-flow predictability and reduce investment risk?
By mitigating price risk (most PPAs include a fixed price over most of or the entire PPA period) and volume risk (most or the entire production of the RES producer is secured and assumed by the off-taker – consumer or supplier)

Who are beneficiaries?
Strategic (existing conventional looking for diversification, RES producers) and financial (private equity, investment funds) investors and corporate consumers.

Estimated impact on power market?
Increase investment in new power plants (mainly RES, but also conventional) generating more stability in terms of power prices, positively impacting the power prices for consumers and offering large consumer the possibility to lower power costs (whole vs. retail prices).

Current impact of PPAs in the Romanian market?
Rising interest from investors to develop new projects, by acquiring existing approved connection capacities or securing new ones. However, there are uncertainties regarding the capacity of the grid to support new RES power without further investments.

PPAs

For high-scale Renewable Energy Plants

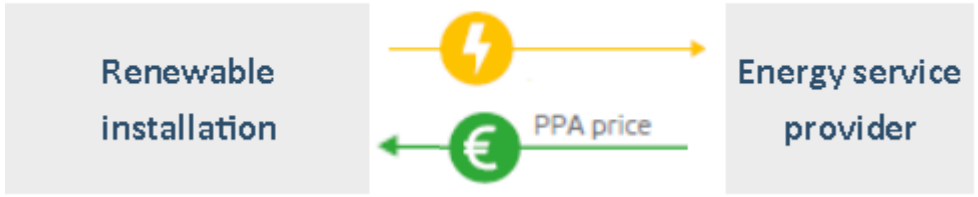
		On-site	Self-owned	Physical electricity delivery	Long-term fixed cost	Local visibility - *in sight of consumers and local community*	More suitable for SMEs	Additionality - *encourages new build renewable projects*
Common Models On-site	A1: Self-owned on-site	•	•	•	•	•	•	•
	A2: Leasing	•		•	•	•	•	•
	A3: On-site PPA	•		•	•	•		•
	A4: Private-wire PPA			•	•	(•)		•
Common Models Off-site	B1: Physical PPA			•	•			•
	B2: Financial PPA				•			•
Off-site Variants	C1: Self-owned off-site		•					•
	C2: Multi-buyer PPA			(•)	•		•	•
	C3: Multi-seller PPA			(•)	•			•
	C4: Cross-border PPA			(•)	•			•
	C5: Multi-technology PPA			(•)	•			•
	C6: Proxy generation PPA			(•)	•			•

Source:: “Risk mitigation for corporate renewable PPAs” presentation prepared by RE-Source in March 2020

Selling Power for Off-site RES Producers

Looking backwards

Merchant PPA (possible before 2014 and starting 07.2020 - OUG 74/2020)



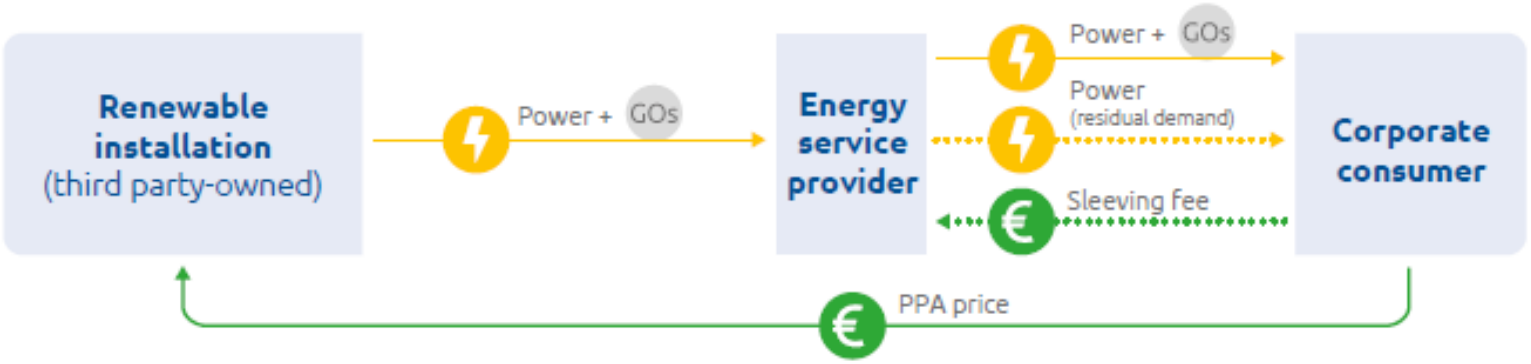
Current general sales strategy for RES producers

A combination of forward (up to 1 year) base-load sale contracts and acquisitions/ sale of power on the day-ahead market to balance production profile to base-load contract

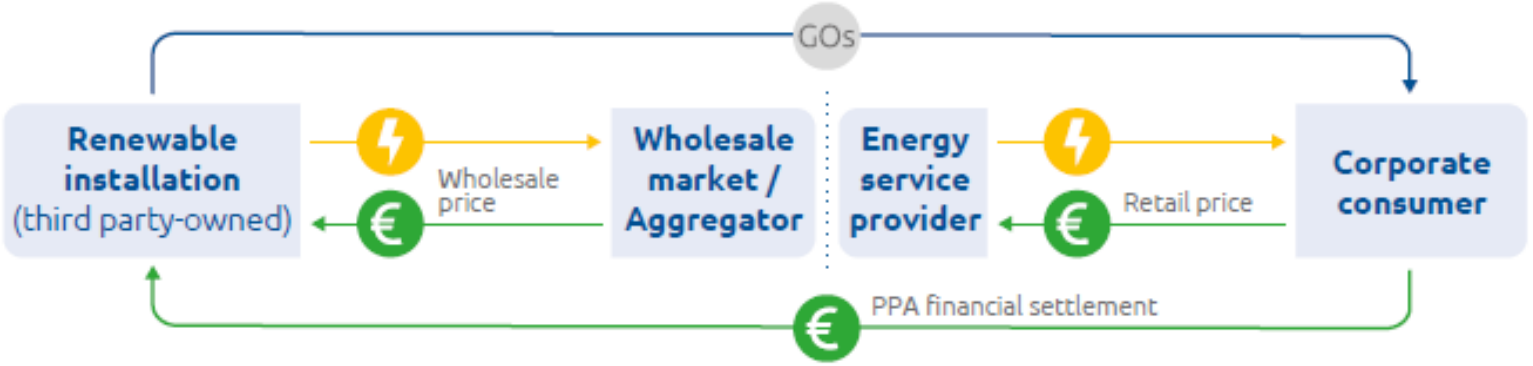
Selling Power for Off-site RES Producers

Looking forward – Corporate PPAs

Corporate renewable PPA via Physical contractual structure



Corporate renewable PPAs via Financial contract structure



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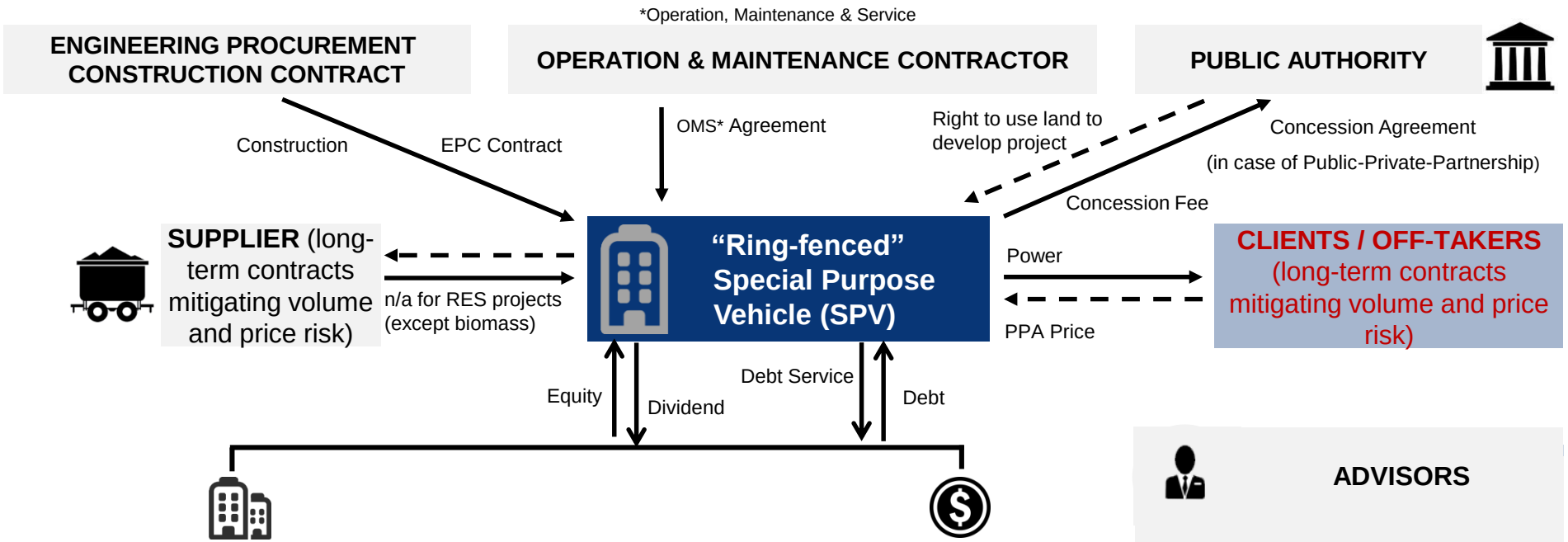
Project Financing Transaction Structure

Allocation of risk for energy production projects



SPONSORS

- **STRATEGIC**: see project financing as an initiative linked to their core business (provide MONEY & KNOW-HOW)
- **PURE FINANCIAL**: see project financing as an opportunity to get substantial returns on their investments (provide only MONEY)

LENDING & HEDGING BANKS

ERSTE Group, SMBC, Deutsche Bank, UniCredit Group, SOCIETE GENERALE, BNP PARIBAS

ADVISORS

LEGAL (permitting, title, contracts, regulatory framework)

INSURANCE (best practice)

TECHNICAL (yield, technology, EPC contract, CAPEX, OPEX, environment)

Project Financing Transaction Structure

Lending Principles for energy production projects

Conditions	Explanation
Strong Sponsor	Investors capabilities to sustain the project, extensive track record, excellent financial standing.
Non-recourse/ Limited Recourse	Limited recourse during construction period/ in some cases for covering off-take/ regulatory risk (in case of incentive schemes).
Min. Equity Level	Not less than 30%, but subject to debt sizing criteria (min. DSCR level)
Loan Maturity	Max. 15 years, but (i) no more than 75% of the asset technical life and (ii) no more than off-take agreements tenor;
Technology	Only proven technologies supplied by reputable suppliers with proper maintenance program in place.
Permitting	All the permits and authorizations for the “ready to build phase” in place
Reputable EPC and O&M	Lump Sum and Turnkey EPC Contract with Standard Liquidated Damages securing delays, performance ratios, availability etc.
Supply and Off-take Agreements	Long term supply and off-take agreements with reputable parties accepted by the lender will be required.
Clean legal& technic. DD from Reputable Party	Review of technical specifications, performance parameters, yield forecast, permitting, real estate, corporate, legal framework and project contracts.
Hedging	Offtake price, Interest Rate and FX risk solution, to mitigate market volatility
Suitable Insurance	Insurance must cover business interruption, mechanical breakdown, operational risks and third party liabilities.
Mortgage	Mortgage over all shares, constructions, equipment, Project Contracts, accounts
Other	In some cases market reports, environmental studies and commercial DD are also required.
Regulatory Framework	Clear and stable legal framework accommodating market reality/ needs and offering predictability.

PPA requirements in Project Financing

Main Points

Counterparty:	Energy supplier and/or large consumer with strong creditworthiness and long-term perspective of business
Volume:	Pay as produced, off-taker to pay for each MWh produced by RES producer, irrespective of production profile. Contract should cover 80-100% of P90 energy produced during loan period
Price:	Fixed price for the entire contract period or at least floor (or linked to market, in case they are combined with a CfD)
Balancing	Should be assumed by a power supplier over loan period
Duration:	For the entire loan period
Termination Compensation:	Off-taker to pay termination compensation, so that the RES producer ends-up in the same position, as if the PPA would still produce effects
Guarantees:	Depending on financial strength of off-taker, a bank guarantee/ corporate guarantee (from an investment grade party) should be provided to guarantee the fulfilment of its obligation and payment of the termination compensation
Timing:	Valid and enforceable PPAs need to be signed as a CP for singing the financing agreement. Obligation of the off-taker to buy power should start at COD (commercial operation date).
Template:	Standardization is essential, especially in case of corporate buyer with little experience regarding such contract. The European Federation of Energy Traders have developed a standard for all types of PPAs.
Other important conditions:	Change in Law, Termination clauses (no unilateral termination)

Next Steps

National Strategies
PNRR – new final version to be sent
PNIESC 2030 – approval EC
LT Renovation Strategy – approval EC?
Strategia Energetica 2030-2050 – 1st draft published
Termoficare Strategy (incl. support scheme for CHP plants) – no updates existing

Regulatory
Legal permission to conclude PPAs – in progress
CfD support sheme– in prgress
Amended off-shore law – in progress
Support current GCs scheme in the context of high expected inflation in 2021

Investmnets
Infrastructure Investments
New production capacities investments
CfD tenders
Consumer energy efficiency investments

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