

# SESSION 4:

DEVELOPING YOUR PROJECT



# PROJECT PHASES



# PHASE 1: CONCEPT AND SITE SELECTION

- RENEWABLE PROJECTS USUALLY BEGIN WITH AN INITIAL SITE SEARCH
- IDENTIFYING AREAS FREE FROM MAJOR CONSTRAINTS
- ASSESS WHETHER POTENTIAL SITES ARE AVAILABLE.
- TECHNICAL RESOURCE, CONSERVATION AND LANDSCAPE DESIGNATIONS, ECOLOGY, PROXIMITY OF DWELLINGS, AVIATION, GRID CONNECTION
- ACCESS TO SITE
- SHORTLIST SITES TO INVESTIGATE FURTHER



# PHASE 2: FEASIBILITY AND SCOPING

IF A SITE IS SELECTED AS BEING POTENTIALLY SUITABLE:

- A RANGE OF CONSULTATIONS AND FEASIBILITY STUDIES WILL BE CARRIED OUT TO INVESTIGATE, IN MORE DEPTH, THE DETAILED ISSUES THAT COULD CONSTRAIN DEVELOPMENT ON THE SITE.
- A REQUEST WILL NORMALLY BE SUBMITTED TO THE LOCAL PLANNING AUTHORITY TO IDENTIFY ALL THE ENVIRONMENTAL ISSUES WHICH SHOULD BE CONSIDERED AS PART OF THE ASSESSMENT PROCESS



# PHASE 3: ASSESSMENT AND DESIGN

- EFFICIENCY ASSESSMENT
- THE COST OF ITS DEVELOPMENT
- ACCEPTABILITY FROM A PLANNING PERSPECTIVE

BEFORE ARRIVING AT A SITE DESIGN IT IS IMPORTANT TO CARRY OUT A WIDE RANGE OF ENVIRONMENTAL AND TECHNICAL STUDIES AND CONSULT WITH DIFFERENT ORGANISATIONS. THESE STUDIES FORM PART OF THE **ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS** WHICH IS TYPICALLY A STATUTORY REQUIREMENT FOR MOST LARGE SCALE RENEWABLE ENERGY PROJECTS.





# PHASE 4: PLANNING

PLANNING IS A CRITICAL STEP IN THE LIFE OF ANY DEVELOPMENT PROJECT.

ONCE A FULL SUITE OF ENVIRONMENTAL ASSESSMENTS HAS BEEN CARRIED OUT ON A FINAL DESIGN SOLUTION, THE NEXT STAGE IS TO PREPARE AND SUBMIT A PLANNING APPLICATION TO THE LOCAL PLANNING AUTHORITY. THE LOCAL AUTHORITY, OR PLANNING INSPECTORATE, WILL CARRY OUT ITS OWN CONSULTATION EXERCISE BEFORE COMING TO A VIEW AS TO WHETHER OR NOT TO GRANT PLANNING PERMISSION.

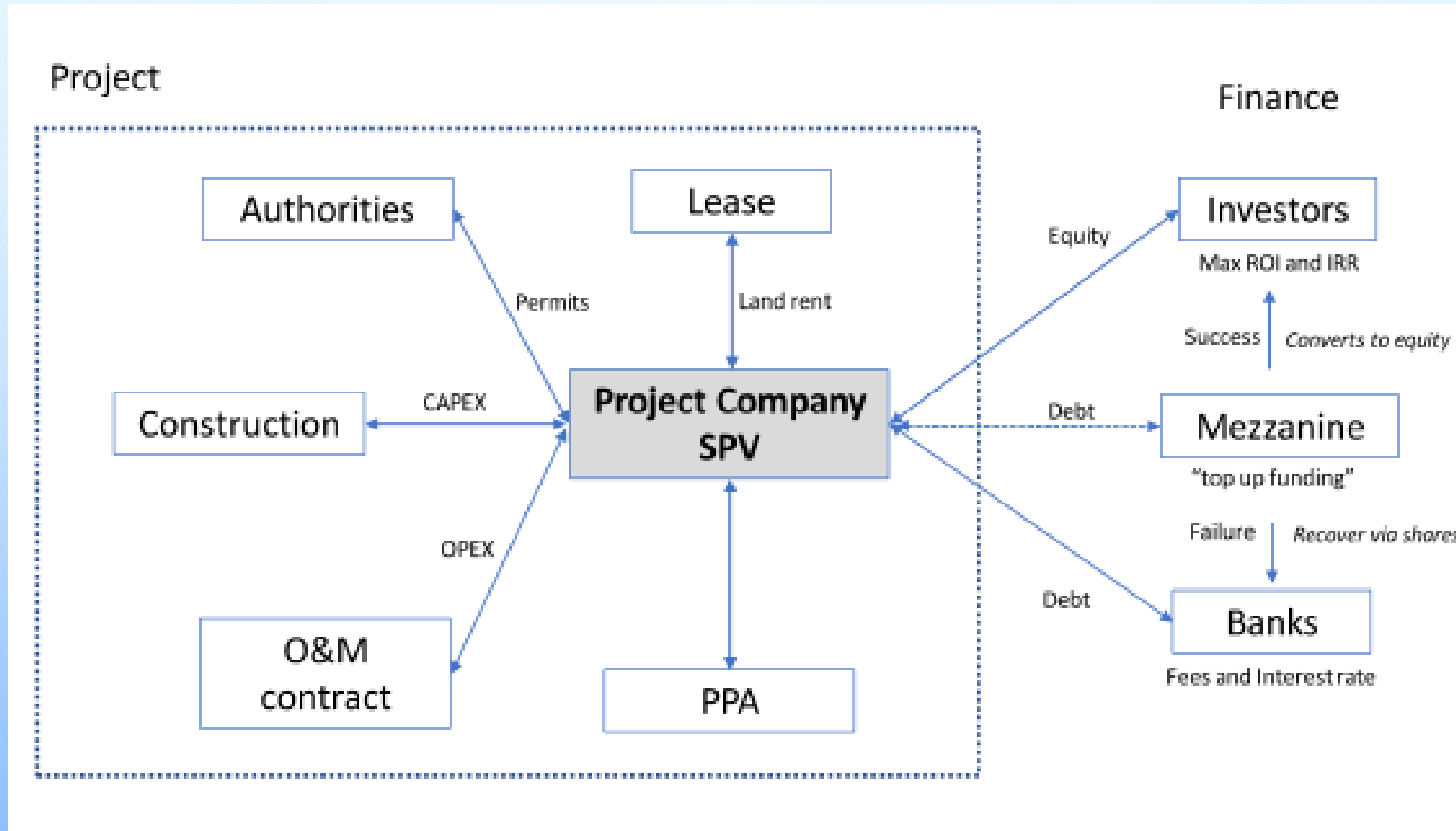


# PHASE 5: FINANCE AND CONSTRUCTION

- ONCE PLANNING PERMISSION HAS BEEN OBTAINED (CONSENTED), CONSTRUCTION WORKS FOR THE PROJECT WILL BE PUT OUT TO COMPETITIVE TENDER.
- FUNDERS OFTEN LIKE TO SEE LOCAL CONTENT IN PROJECTS EG FOR THE CIVIL WORKS (AGGREGATES, ROADS, FOUNDATIONS AND ANY BUILDINGS),
- EQUIPMENT (WIND TURBINES / SOLAR PANELS / ELECTRICAL EQUIPMENT ETC.) WILL TYPICALLY BE SUPPLIED BY ONE OF A NUMBER OF MANUFACTURERS. SUPPLIERS CAN BE PRE-SELECTED IF A PARTICULAR TECHNOLOGY IS APPROPRIATE.
- BEWARE OF LONG LEAD TIME ITEMS
- THE ENTIRE CONSTRUCTION PROCESS TYPICALLY TAKES BETWEEN NINE AND TWELVE MONTHS FOR A WIND FARM. THE CONSTRUCTION PROCESS FOR SOLAR IS SHORTER.
- OBTAINING CONSENT CAN BE THE LONGEST PART OF THE ENTIRE PROCESS

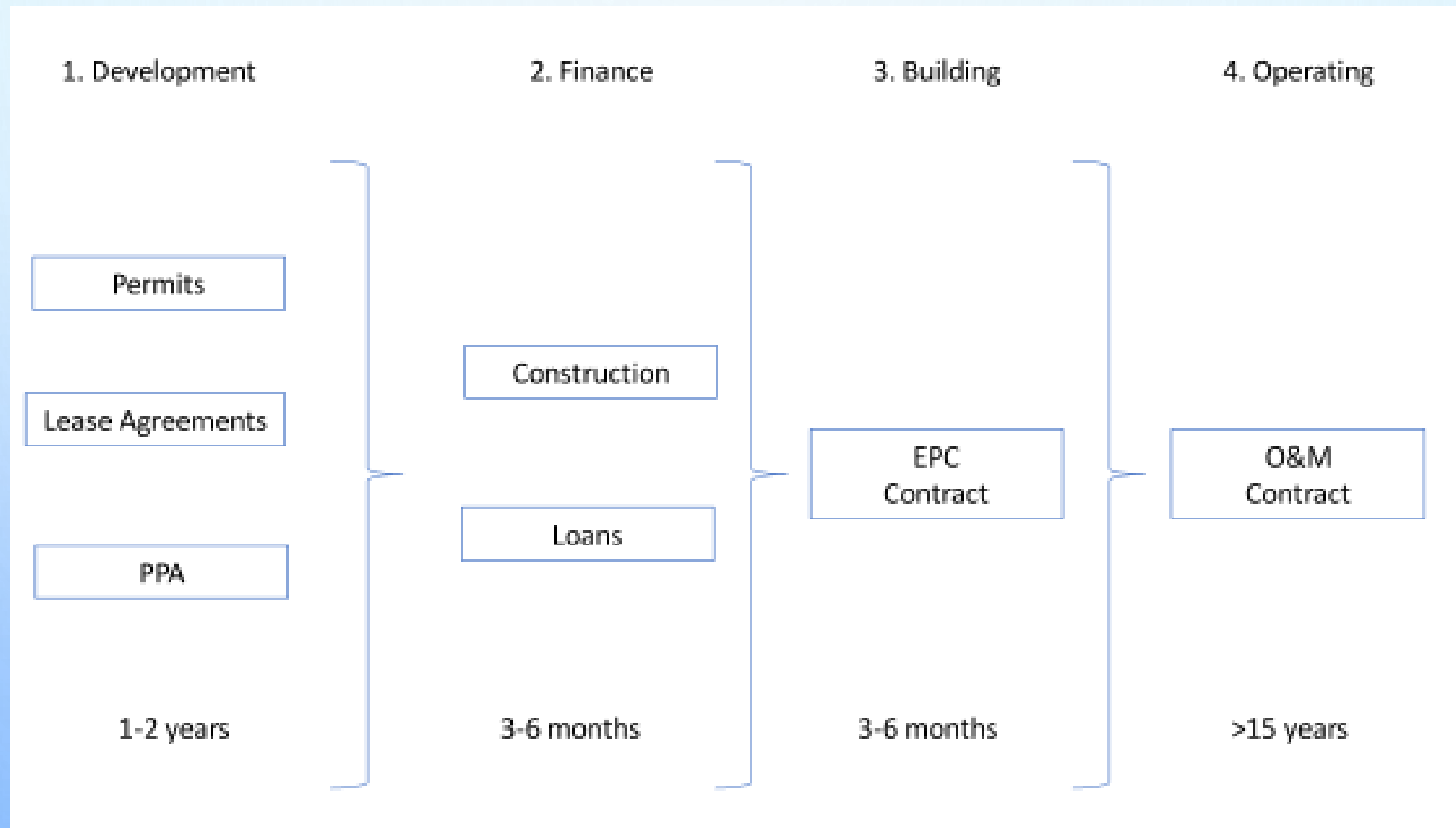


# SPECIAL PURPOSE VEHICLES (SPVS)





# PROJECT / LIFETIME PHASES



# DON'T FORGET

- FREQUENT AND OPEN STAKEHOLDER ENGAGEMENT
- PUBLIC RELATIONS
- MANAGE DEVELOPMENT EXPENDITURE CAREFULLY
- TALK TO OTHERS WHO HAVE DEVELOPED SIMILAR PROJECTS – LEARNING BY DOING
- UNDERSTAND YOUR COSTS AND RETURNS



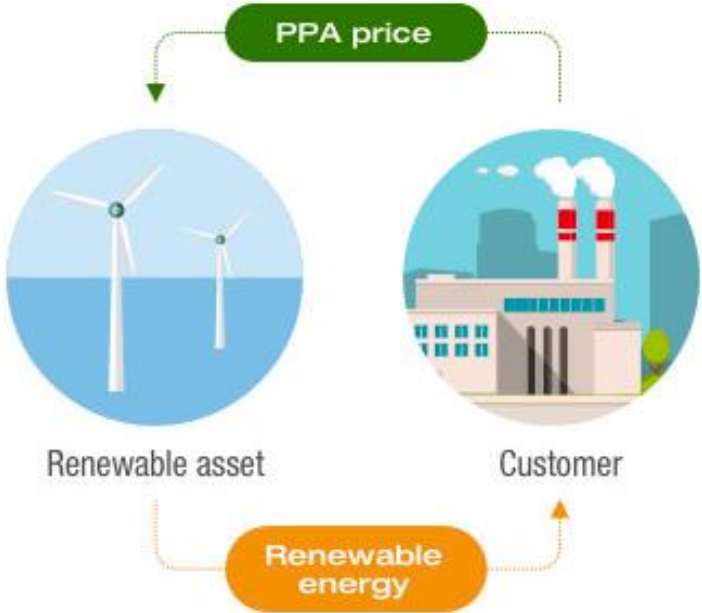
# POWER PURCHASE AGREEMENTS



# POWER PURCHASE AGREEMENTS

## OFF-SITE PPA

Renewable energy produced at an optimal location and connected to the grid.



## ON-SITE PPA

Renewable energy produced near on-site of the customer facilities.



# PPA'S – PROS

- LONG-TERM PRICE SECURITY
- OPPORTUNITIES TO FINANCE INVESTMENTS IN NEW POWER GENERATION CAPACITIES
- REDUCTION OF RISKS ASSOCIATED WITH ELECTRICITY SALES AND PURCHASES.
- SPECIFIC PHYSICAL SUPPLY OF ELECTRICITY WITH CERTAIN REGIONAL CHARACTERISTICS AND GUARANTEES OF ORIGIN CAN OCCUR. CUSTOMERS CAN USE THIS OPPORTUNITY TO MAKE THEIR BRAND MORE SUSTAINABLE AND GREENER.
- THE OPEN-END OF THE CONTRACT'S DESIGN ALSO CREATES A GREAT DEAL OF LEEWAY TO REFLECT PREFERENCES OF INDIVIDUAL PLANT OPERATORS AND ELECTRICITY CONSUMERS.
- PPAS CAN BE SIGNED AT FIXED PRICES, OR CAN ALLOW FOR GREATER PARTICIPATION IN MARKET RISKS AND OPPORTUNITIES.





# PPA'S – CONS

- PPAS ARE COMPLEX CONTRACTS
- OFTEN REQUIRE A GREAT DEAL OF TIME AND NEGOTIATION PRIOR TO CONCLUSION.
- THE LONG-TERM NATURE OF PPAS CAN BE A DISADVANTAGE IN THE EVENT OF PRICE DEVELOPMENTS THAT END UP BEING NEGATIVE FOR ONE PARTY.
- ELECTRICITY PRODUCTION ITSELF – ESPECIALLY FROM WIND AND SOLAR – CAN FLUCTUATE. IF THE QUANTITIES OF ELECTRICITY – AGREED UPON WELL IN ADVANCE – ARE NOT AVAILABLE AT THE TIME OF DELIVERY, THE PLANT OPERATOR MUST PROVIDE FINANCIAL OR PHYSICAL COMPENSATION, OR OUTSOURCE TO A THIRD PARTY SUCH AS AN ELECTRICITY TRADER.

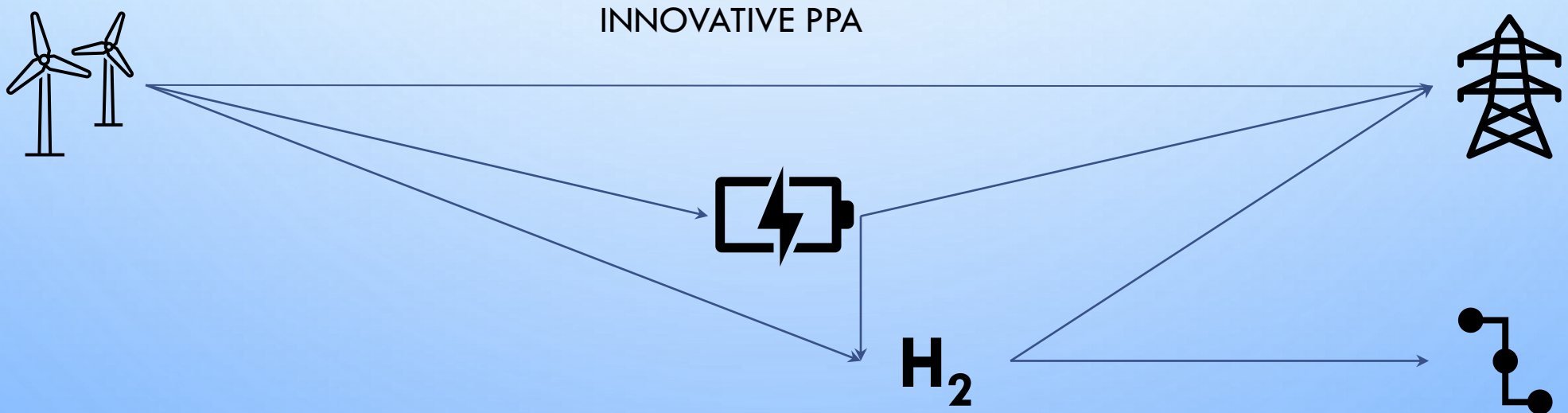
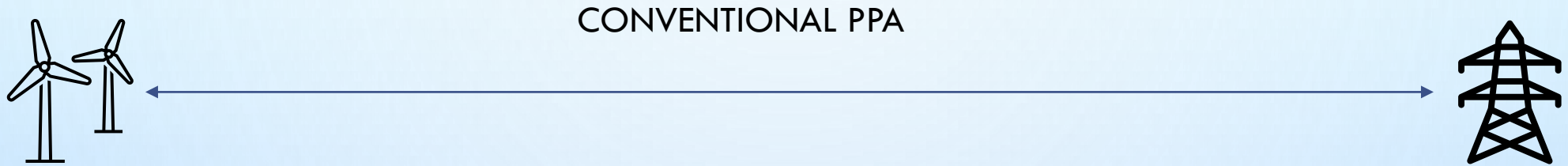


# WHAT ABOUT HEAT AND BIOGAS

- SIMILAR PROCESS TO PPAS – OFFTAKE NEEDS TO BE SECURED TO ENSURE PROJECT IS BANKABLE
- CONSIDER DISTRICT HEATING SCHEMES AND SUPPLY CONTRACT TO GAS TNOS



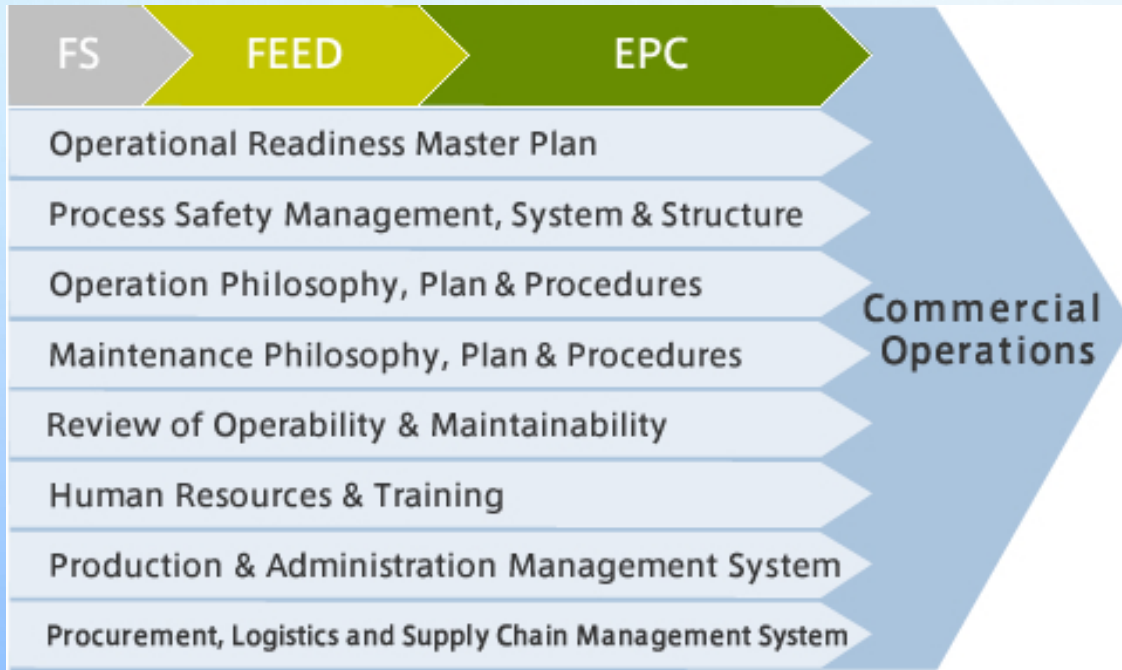
# HYDROGEN AND PPA INNOVATION



# MORE ON PROJECT PHASES



# EPC PHASES



FS: FEASIBILITY STUDY

FEED: FRONT END ENGINEERING DESIGN

EPC: ENGINEERING, PROCUREMENT,  
CONSTRUCTION

FID: FINAL INVESTMENT DECISION





# INNOVATION IN ENGINEERING CONTRACTORS

- SWEAT EQUITY
- WORKFORCE TRANSITION
- LOCATION SHIFT
- STRATEGIC PARTNERSHIPS
- CHANGE FROM O&M TO S&M (SERVICING AND MAINTENANCE)
- NEW PLAYERS



# NREL'S MODEL (PART 1)

- **SITE:** A FINANCEABLE PHYSICAL LOCATION WITH FULL LEGAL CLARITY REGARDING OCCUPANCY AND PHYSICAL CONSTRAINTS.
- **RESOURCE:** HIGHLY DETAILED HOURLY OR SUB-HOURLY DATA AND ANALYSIS OF RESOURCE AVAILABILITY, QUALITY, AND CHARACTERISTICS WITHIN A TIGHT RANGE OF CERTAINTY.
- **OFFTAKE:** SECURE THE BUYER OF THE ENERGY A POWER PURCHASE AGREEMENT (PPA) OR OTHER CONTRACTING METHOD. IN REGULATED MARKETS, PROPER APPROVALS MUST BE IN PLACE. SETTLE ISSUES OF TRANSMISSION AND INTERCONNECTION.
- **PERMITS:** ALL PERMITS NECESSARY. IF A PROJECT HAS A HIGH HURDLE FOR PERMITTING, AND THEREFORE INCLUDES SIGNIFICANT PERMIT OR POLICY RISK, IT NEEDS TO BE UNDERSTOOD AND EXECUTED WITH THAT KNOWLEDGE IN MIND.
- **TECHNOLOGY:** THIS IS THE TECHNOLOGY DEVELOPED IN THE PROJECT, TAKEN TO THE INVESTMENT, ENGINEERING DESIGN, EQUIPMENT SELECTION, AND PROCUREMENT STAGES.
- **TEAM:** A TEAM WITH PROVEN EXPERIENCE AND ABILITY IN ALL BUSINESS, TECHNICAL, FINANCIAL, LEGAL, AND OPERATIONAL ASPECTS OF A RENEWABLE ENERGY PROJECT IS ESSENTIAL BEFORE RAISING DEBT, EQUITY, AND INCENTIVE/GRANT PROGRAM CAPITAL.
- **CAPITAL:** MEETING ABOVE WILL ATTRACT THE FINANCIAL RESOURCES TO GET COMMERCIAL OPERATION DATE (COD). FINANCIAL CLOSE IS THE LAST STEP BUT CAPITAL-RAISING TAKES PLACE INCREMENTALLY IN PREDEVELOPMENT AND DEVELOPMENT STAGES AS WELL.



## NREL'S MODEL (PART 2)

- **BASELINE:** ANALYSIS OF THE ENERGY SUPPLY REALITY AND/OR A CLEAR STATEMENT OF SPECIFIC GOALS.
- **ECONOMICS:** THE TOTAL COST OF ACQUIRING ENERGY FROM EXISTING SOURCES SHOULD BE COMPARED TO THE COST OF ACQUIRING IT FROM THE PROPOSED RENEWABLE SOURCES. RULE OF THUMB: PROJECT SHOULD HAVE 20 - 30 PERCENT MARGIN ABOVE GENERAL COST ESTIMATES TO ACCOMMODATE PROFIT AND UNCERTAINTY AT THE CONCEPT STAGE. LESS MAY MEAN IT MAY NOT HAVE SUPPORTIVE ECONOMICS.
- **POLICY:** ALL NATIONAL, REGIONAL AND LOCAL POLICY REQUIREMENTS MUST BE MITIGATED, REMOVED OR DEALT WITH.
- **TECHNOLOGY:** SOLAR, WIND OR PICK IT. IT IS NECESSARY TO DEFEND AGAINST NONBANKABLE OR UNREALISTIC EARLY-STAGE TECHNOLOGIES.
- **CONSENSUS:** THE PROJECT DEVELOPMENT PROCESS WILL INVOLVE MANY PARTIES' INPUT, INVESTMENT, AND POSSIBLY COMPROMISE. WITHOUT CONSENSUS, STAKEHOLDERS CAN BECOME ADVERSARIES TO THE PROJECT BEFORE IT EVEN BEGINS







# RESOURCES

[HTTPS://WWW.GREENTECHMEDIA.COM/ARTICLES/READ/WHATS-IT-LIKE-TO-BE-A-RENEWABLE-ENERGY-PROJECT-DEVELOPER](https://www.greentechmedia.com/articles/read/whats-it-like-to-be-a-renewable-energy-project-developer)

[HTTPS://WWW.NREL.GOV/DOCS/FY13OSTI/57963.PDF](https://www.nrel.gov/docs/fy13osti/57963.pdf)

[HTTP://WWW.COMMUNITYPLANNING.NET/PUB-FILM/PDF/GUIDETODEVELOPINGACREPROJECT.PDF](http://www.communityplanning.net/pub-film/pdf/guidetodevelopingacreproject.pdf)

[HTTPS://WWW.BRE.CO.UK/FILELIBRARY/PDF/OTHER\\_PDFS/KN5524\\_PLANNING\\_GUIDANCE REDUCED.PDF](https://www.bre.co.uk/filelibrary/pdf/other_pdfs/KN5524_planning_guidance_reduced.pdf)





# Q & A

