



ENERGY  
INVESTMENT  
MANAGEMENT

# Masterclass Energy Asset Project Finance

8 June 2021

# Agenda

- Introduction
- Energy Transition and Energy Finance - Csinszka
- Energy Asset Project Finance - Leon
- Case studies - Denisa
- Q & A
- Closing

# Energy Investment Management BV

*Investment Management & Advisory Boutique*

*with focus on*

*Energy Transition Assets and Cleantech Ventures*

## Advisory

Advisory services related to investments in energy industry assets and cleantech ventures: development, transactions and implementation

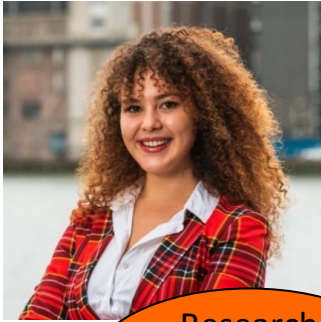
## Thought Leadership

We show and create leadership in investment management in energy transition assets and cleantech ventures with organizing and participating in: research projects, programs, networks and events

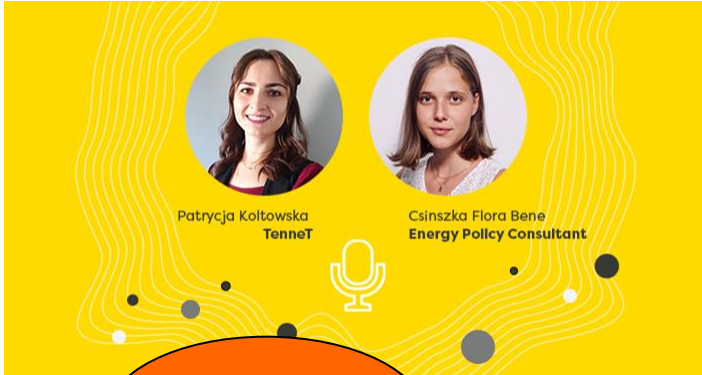
## Investments

We invest ourselves with our private investor network in energy transition assets and cleantech ventures. We structure investment portfolios, develop fund structures and participation concepts

# Program



Research  
Erasmus  
University



Enlit Europe



Master-classes  
...

Research  
....

## East-European Energy Transition Entrepreneurial Opportunities Program

Research  
VU  
Amsterdam

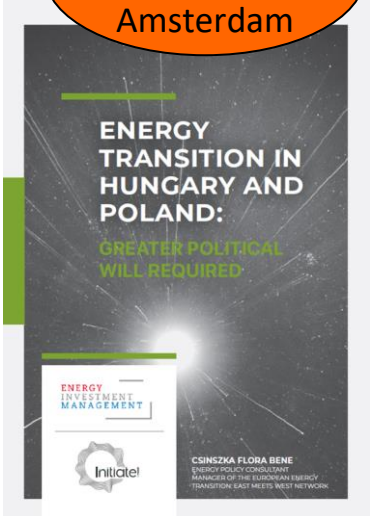
EU SEW

East  
European  
Knowledge  
Team

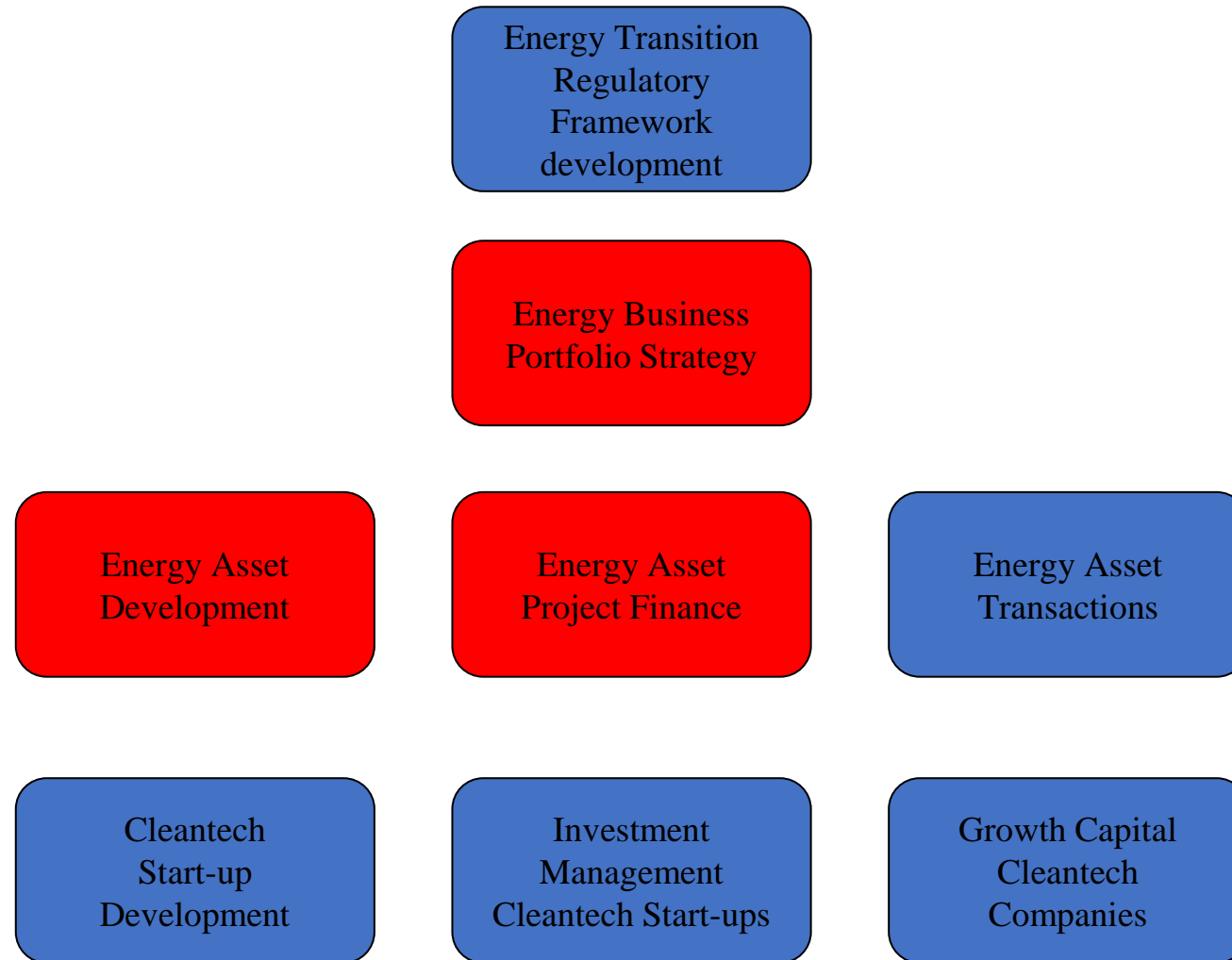
Cooperation  
Energy  
Community

...

Multi Media  
Eastern  
Europe



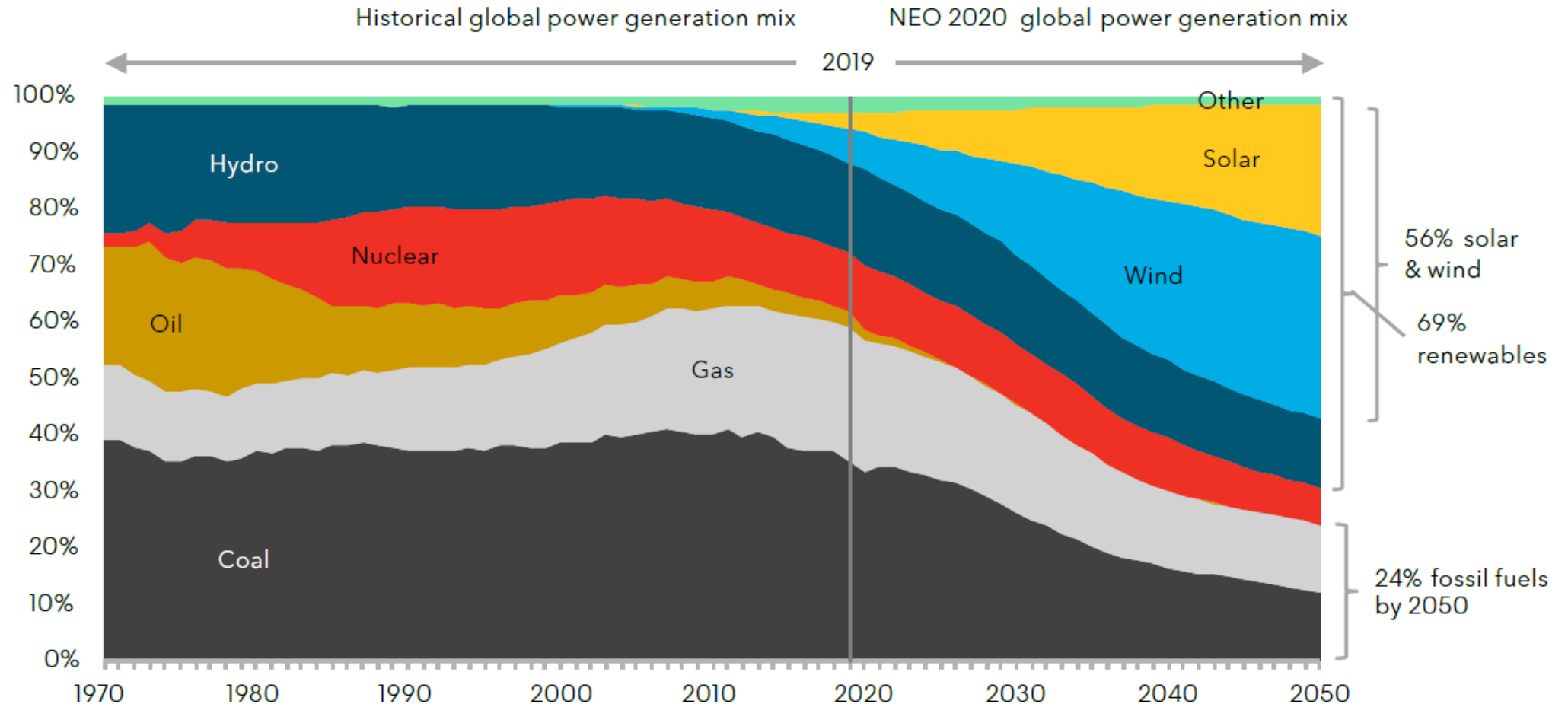
# Masterclass Series Energy Investment Management



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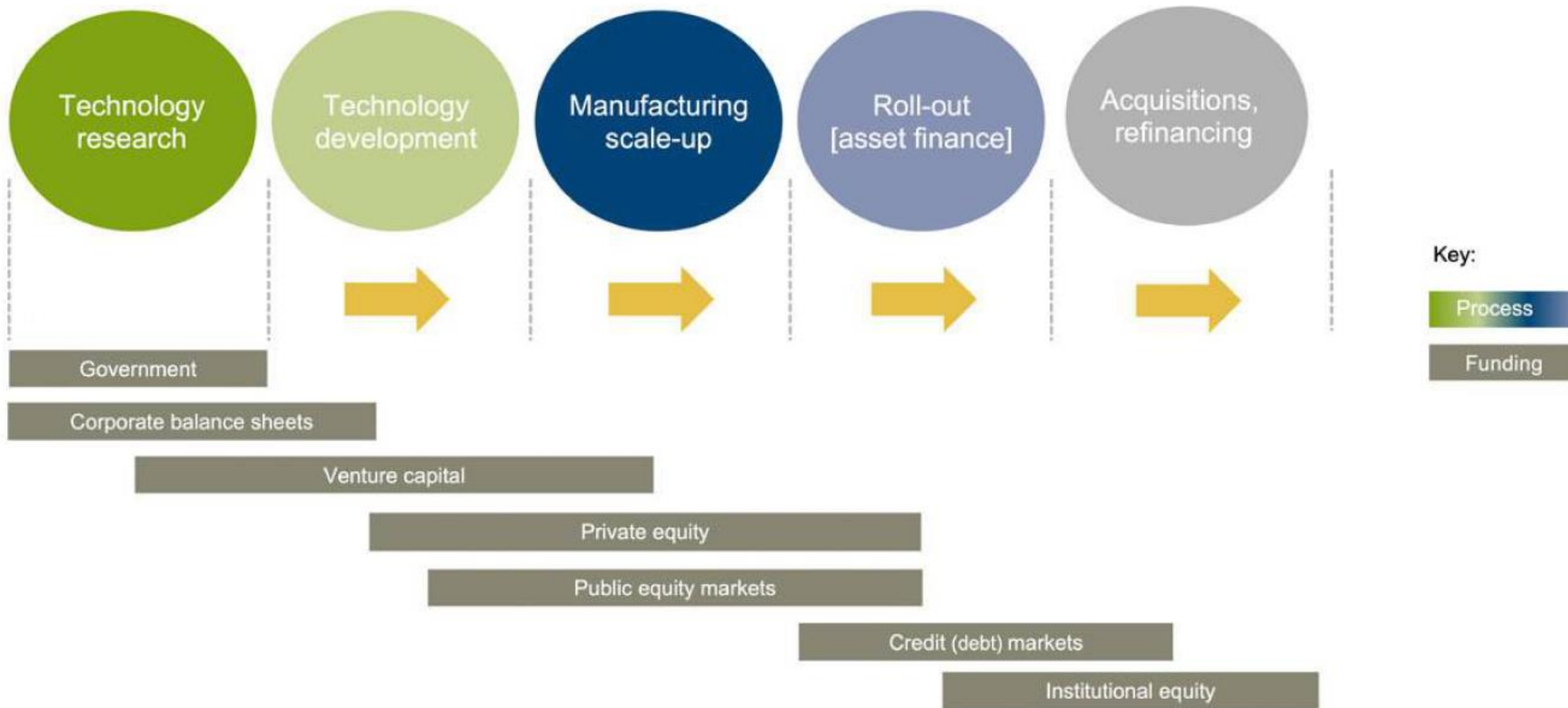
# Global electricity generation mix



Source: BloombergNEF, IEA



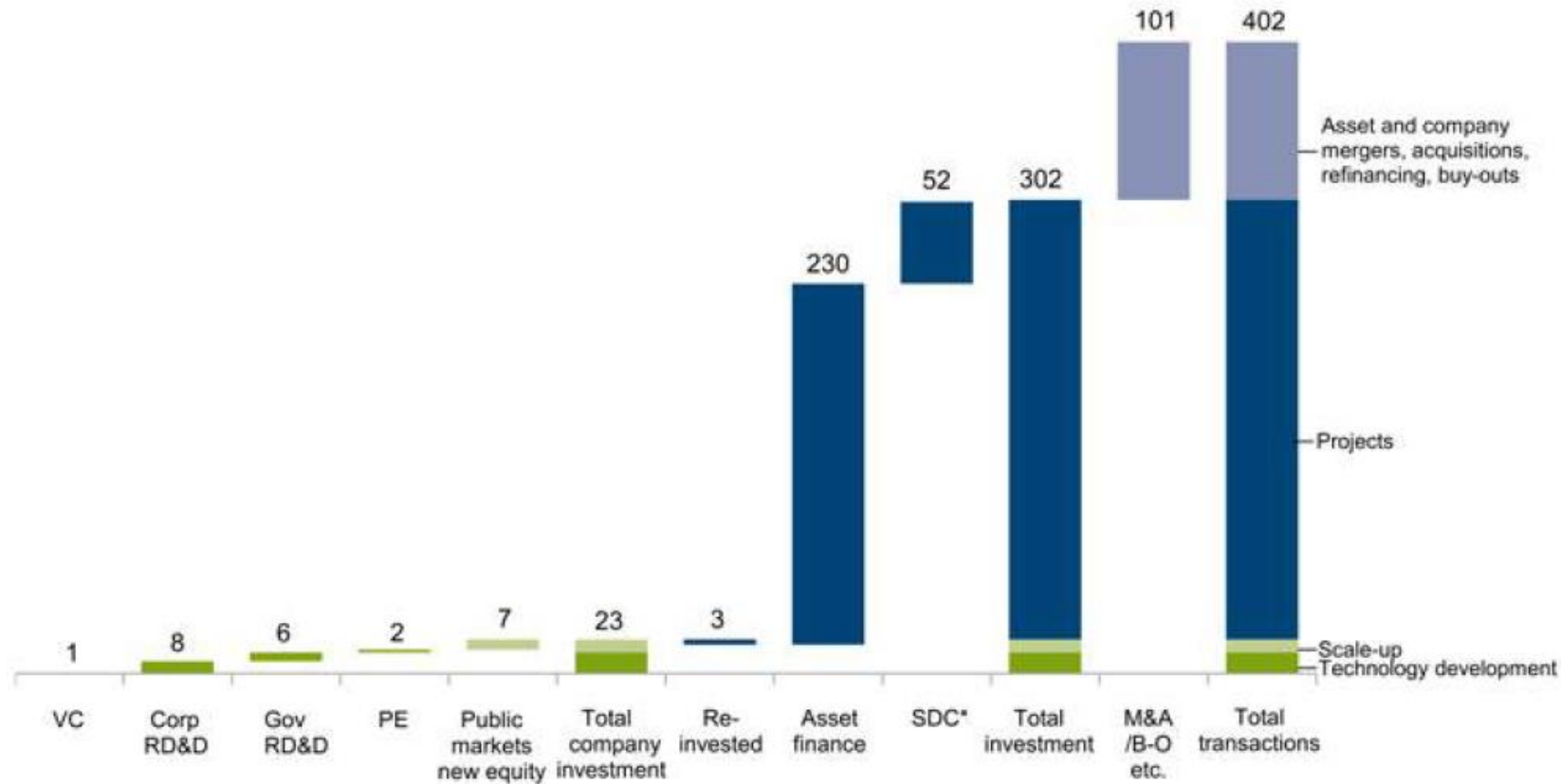
FIGURE 39. FINANCING CONTINUUM



GLOBAL TRENDS IN RENEWABLE ENERGY INVESTMENT 2020,  
Frankfurt School-UNEP Centre/BNEF. 2020,  
[https://www.fs-unep-centre.org/wp-content/uploads/2020/06/GTR\\_2020.pdf](https://www.fs-unep-centre.org/wp-content/uploads/2020/06/GTR_2020.pdf)



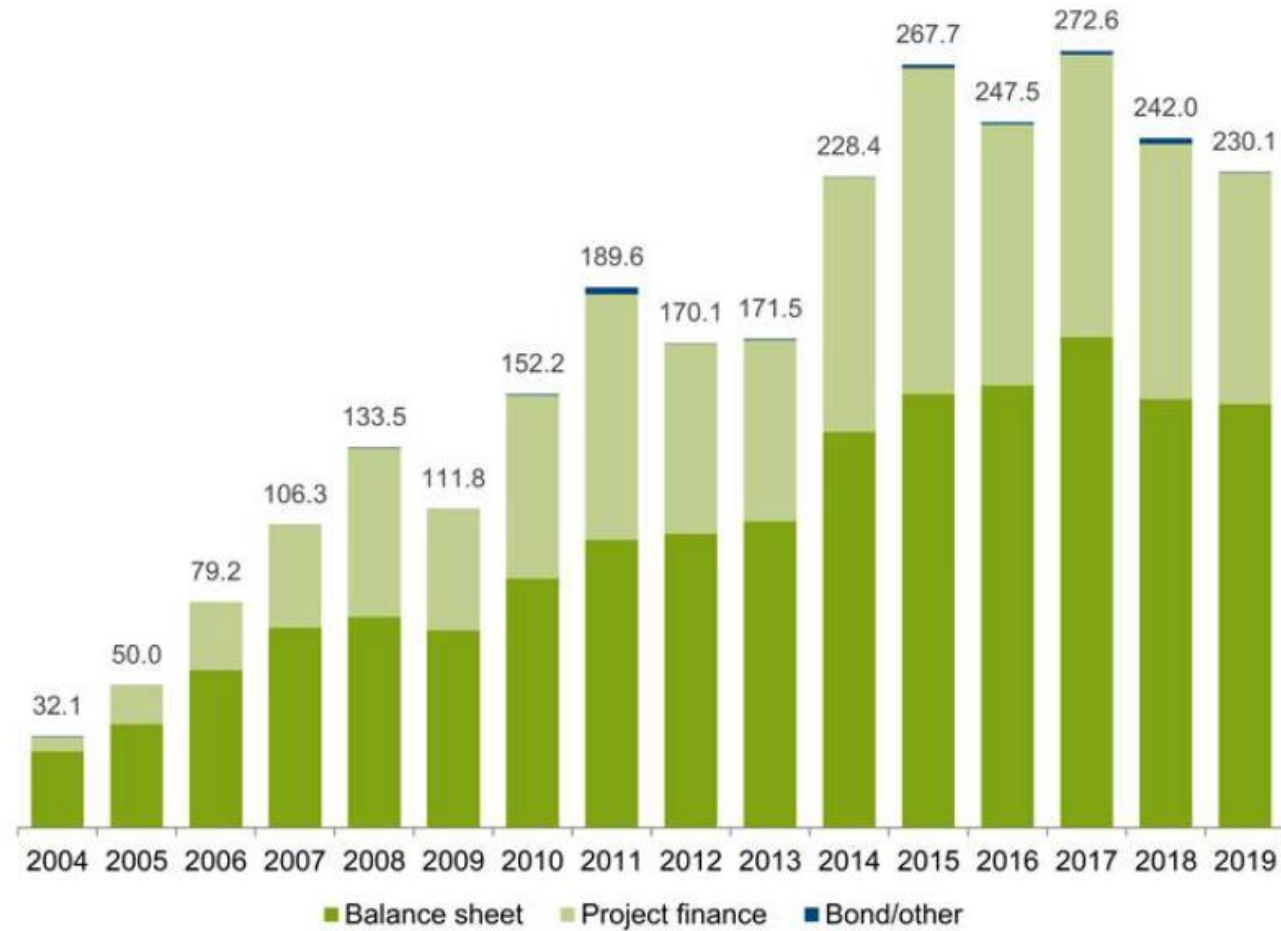
**FIGURE 41. GLOBAL TRANSACTIONS IN RENEWABLE ENERGY, 2019, \$BN**



SDC = small distributed capacity. Total values include estimates for undisclosed deals. Figures may not add up exactly to totals, due to rounding.

Source: UNEP, Frankfurt School-UNEP Centre, BloombergNEF

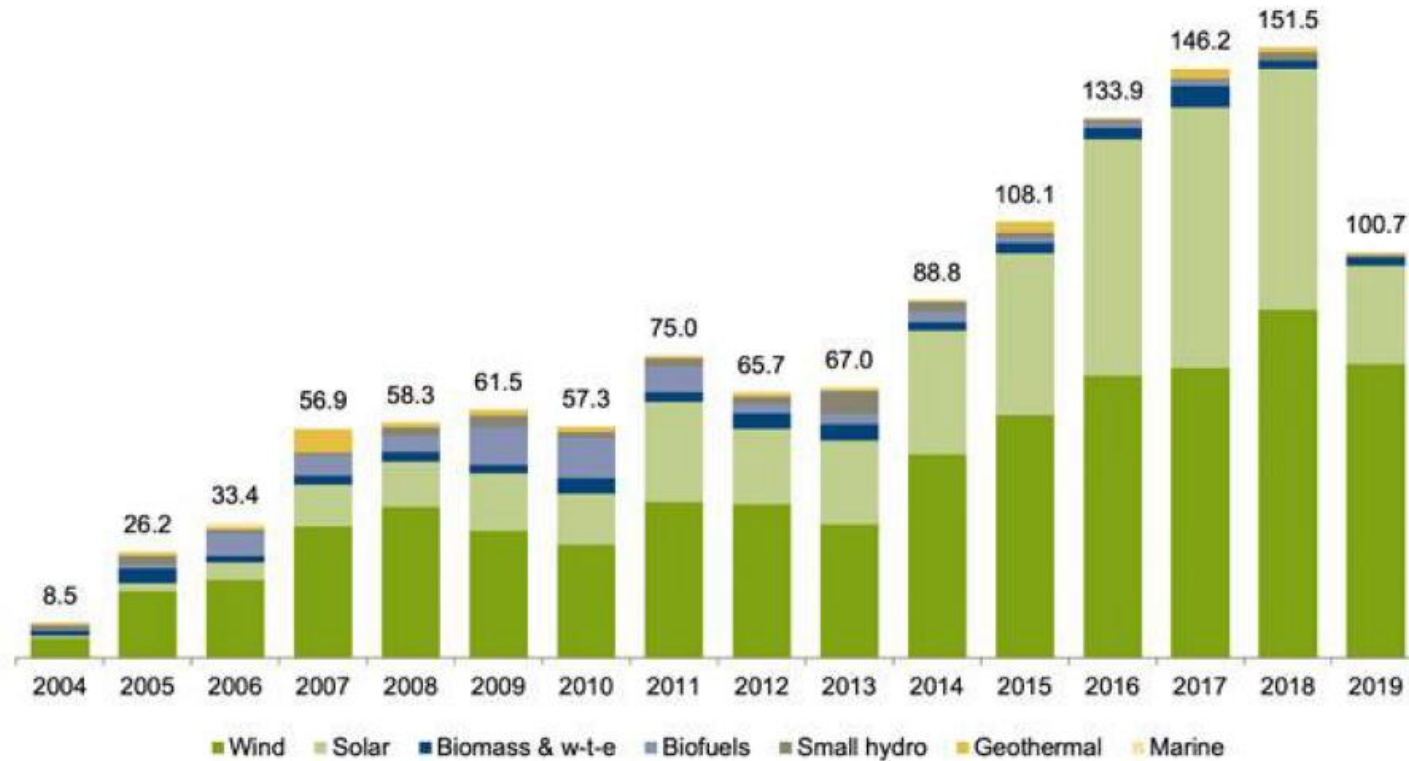
**FIGURE 23. ASSET FINANCE INVESTMENT IN RENEWABLE ENERGY BY MODE OF FINANCE, 2004-2019, \$BN**



Total values include estimates for undisclosed deals.

Source: UNEP, Frankfurt School-UNEP Centre, BloombergNEF

**FIGURE 57. ACQUISITION TRANSACTIONS IN RENEWABLE ENERGY BY SECTOR, 2004-2019, \$BN**



Total values include estimates for undisclosed deals.

Source: UNEP, Frankfurt School-UNEP Centre, BloombergNEF

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# Learning the asset development and financing language

SPC	Special Purpose Company (legal entity)
DSCR	Debt Service Cover Ratio
MoU	Memorandum of Understanding
FID	Financial Investment Decision
BOD	Basis of design
ISBL	Inside Battery Limit (within the site)
OSBL	Outside Battery Limit
PPA	Power Purchase Agreement
VAR	Value Assurance Review (Value at Risk)
TAR	Technology Assurance Review
HSE	Health Safety Environment
EPC	Engineering Procurement Construction

[https://en.wikipedia.org/wiki/Project\\_finance](https://en.wikipedia.org/wiki/Project_finance)

## Definition project finance

A financial structure where lenders have recourse primarily to the revenue-stream of the project or asset they are financing, rather than to the balance sheet of the sponsors.



# Comparison with other financing types

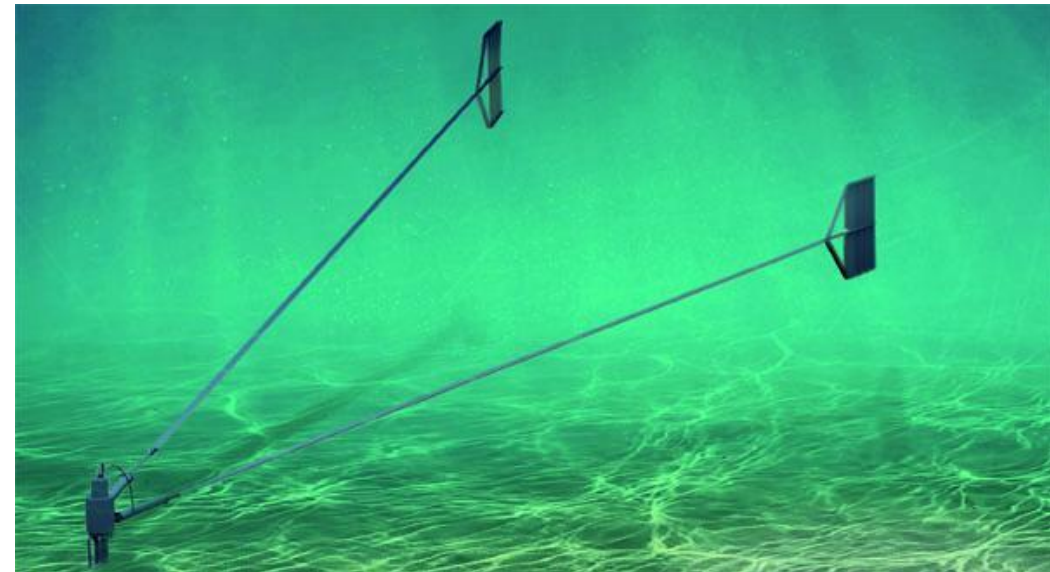
## Balance sheet Finance

The lending decision is based on the overall corporate balance sheet. The cash flow and assets of the company are relied upon by the lender as basis for servicing the additional debt necessary to develop, construct and operate the project and to collateralize the loan

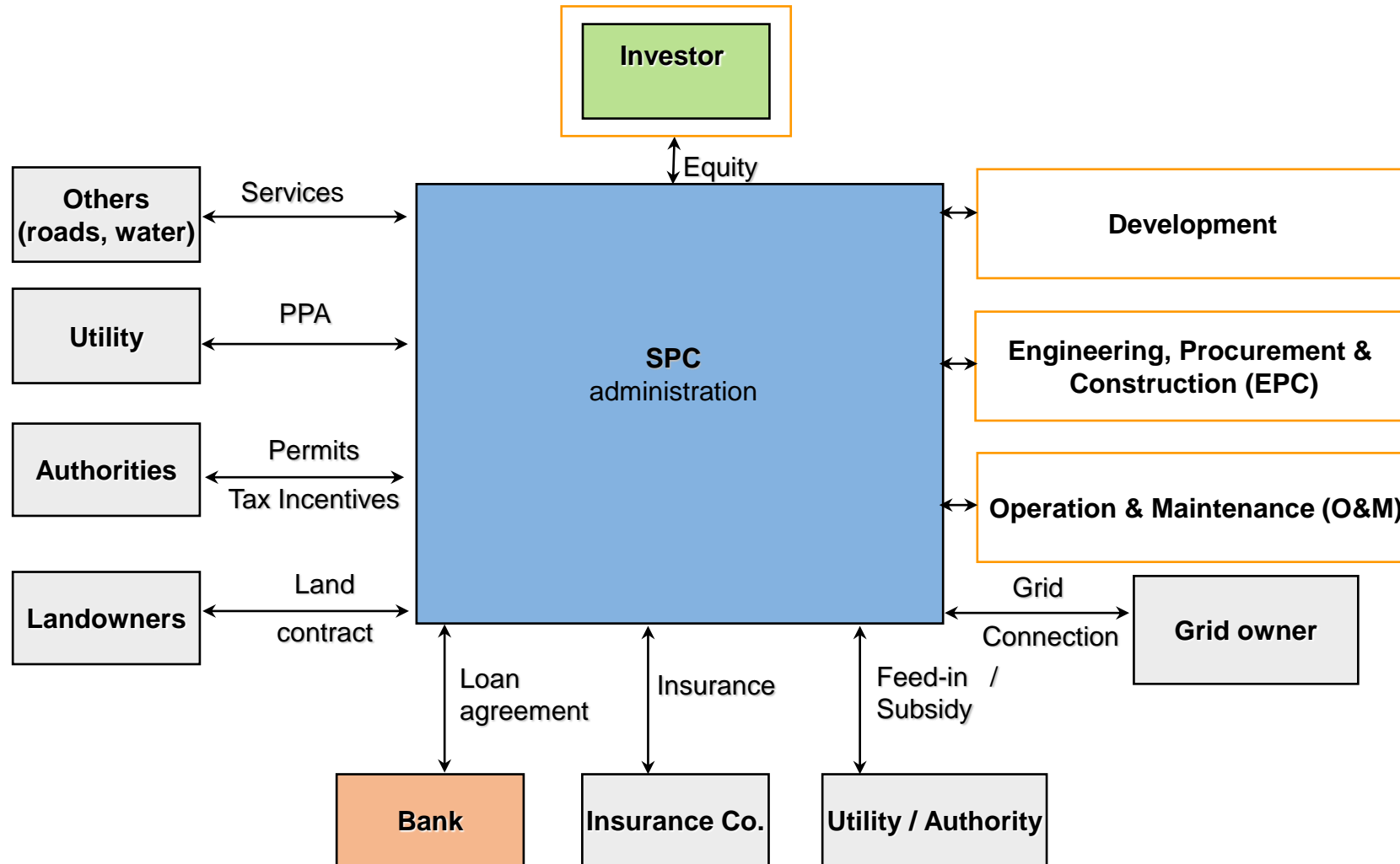
## Asset-Based Finance

An asset-based financing is founded on the value of the assets financed. In a project financing, the hard assets probably would not produce sufficient cash in foreclosure sale to justify the value of an asset-based loan

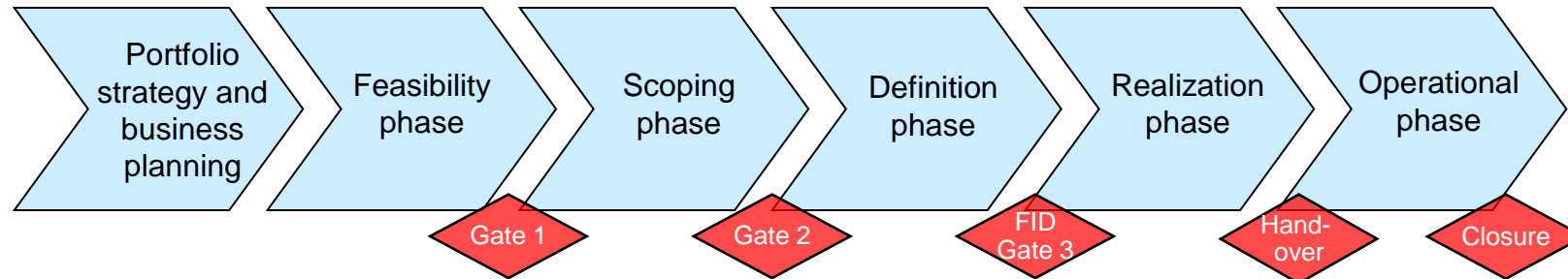
# Energy Asset Classes



# Structuring of an energy asset in a SPC



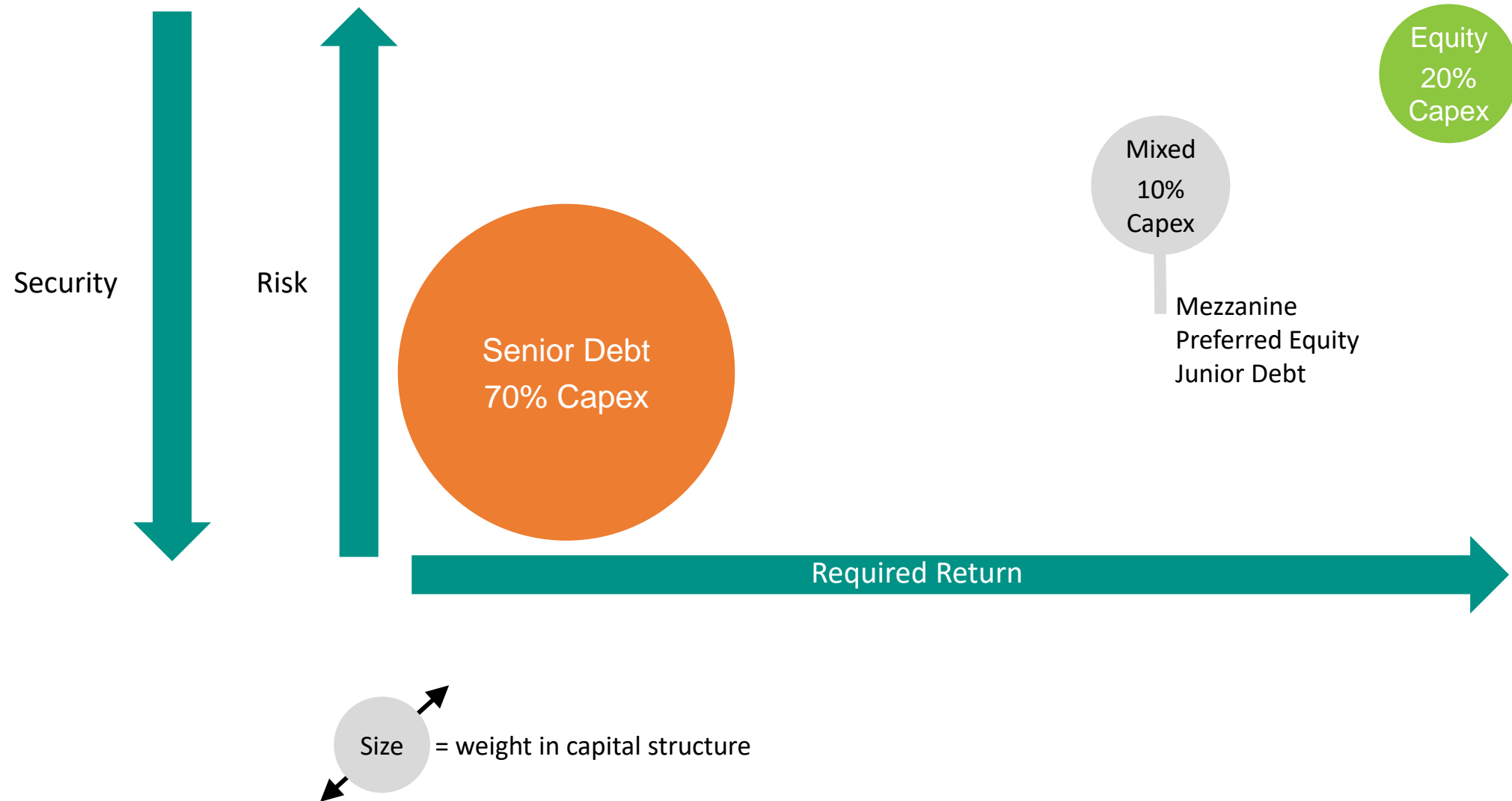
# Project lifecycle – overview



Six phases can be distinguished in the project lifecycle:

- |  |   |
|--|---|
| Portfolio strategy and Business Planning | : Select relevant activities for organization based on the long term strategy and scope |
| Feasibility                              | : Assess leads on their feasibility (identify show-stoppers)                            |
| Scoping                                  | : Select and optimize business opportunities  |
| Definition                               | : Define, negotiate and finalize contracts  |
| Realization                              | : Realization of the project (including commissioning)                                  |
| Operational                              | : Operational management of asset   |

# Capital layers in project finance structure



# Financiers count only the project revenues



Challenges of financiers:

project generates insufficient cash-flow during project life cycle:

- Project cost for development, realization and operations
- Cash flow available for debt service (interest, debt repayment)
- Return on equity

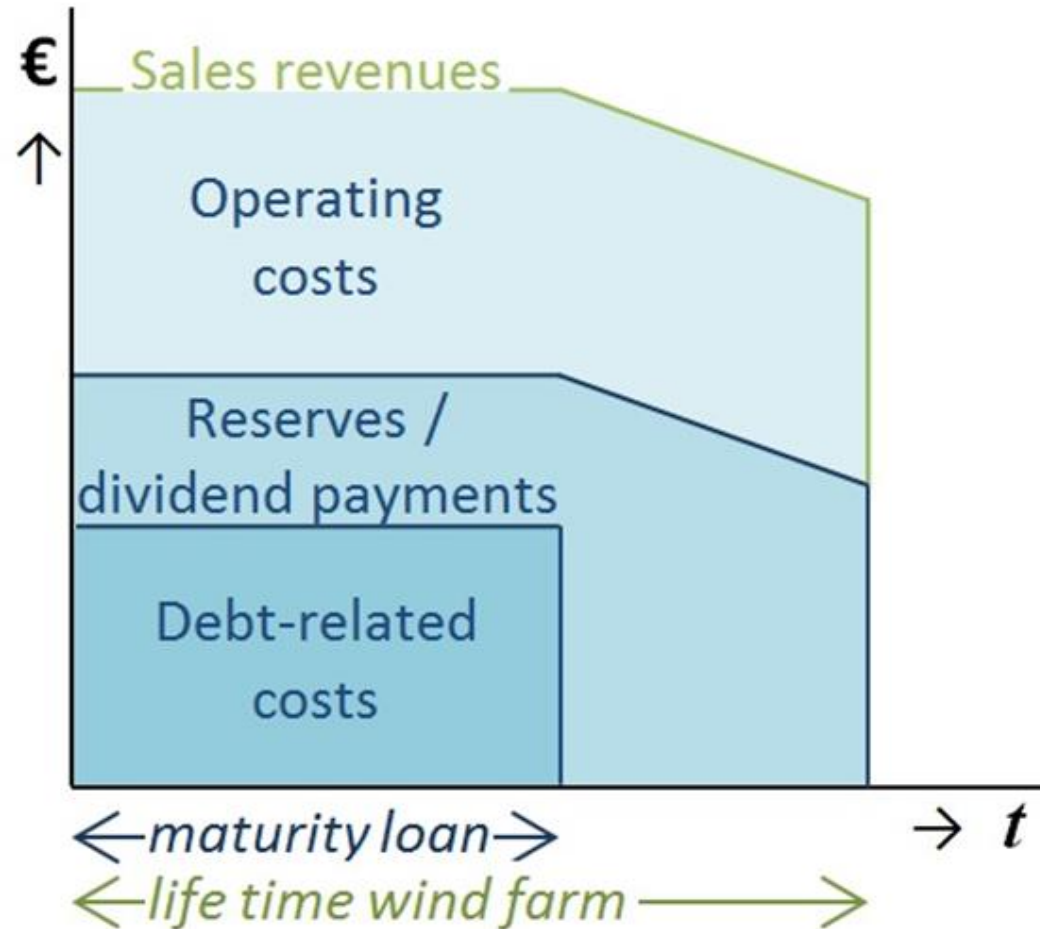


Give confidence:

Insights in mitigation measures for risks that limit project revenues!



# Different financiers, different requirements



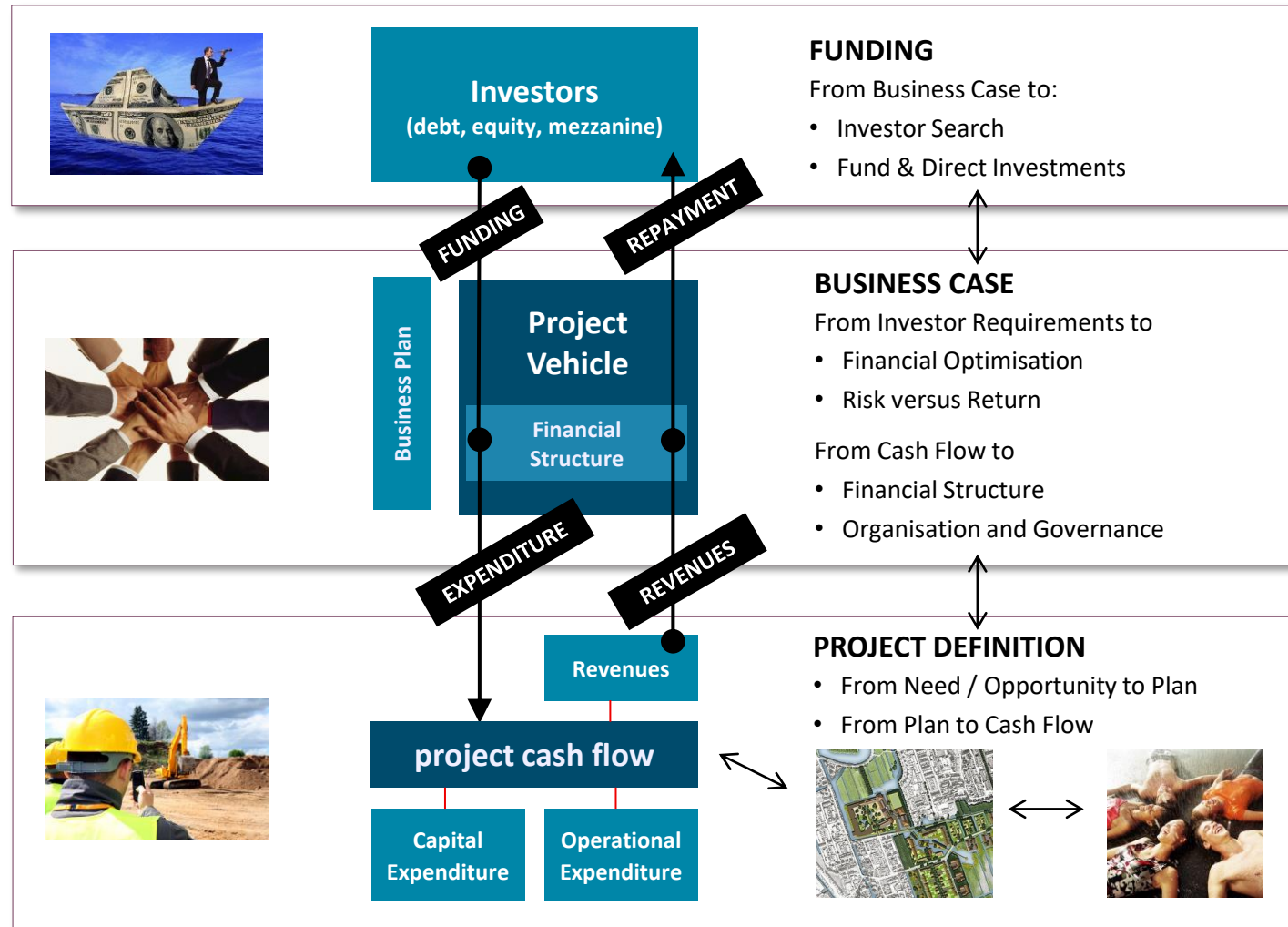
## Debt providers

- Requirements: project revenues  $>$  Interest + Debt repayment
- Main criteria: a minimum level of '*Debt Service Cover Ratio*' (DSCR): operational cash flow available / interest + debt repayment

## Equity providers

- Requirements: Project life time  $>$  Loan life time ('tail')
- Main criteria: Internal Rate of Return (IRR) on equity

# Financial modelling



# FAST Modelling Standard

- Set of rules on the structure and detailed design of spreadsheet-based models.
- Developed through the collaborative participation of professional financial modellers across the globe.
- Organised in FAST Standards Organization Limited, established to own, maintain and further develop the Standard, under the guidance of a Moderation Board.

**F**lexible, adaptable and allow users to run scenarios and sensitivities

**A**ccurate, reflect key business assumptions directly and faithfully without unnecessary detail

**S**tructured, consistency in model layout and organisation

**T**ransparent, simple and clear formulas

- <http://www.fast-standard.org/>
- <http://info.f1f9.com/31-day-financial-modelling-course>

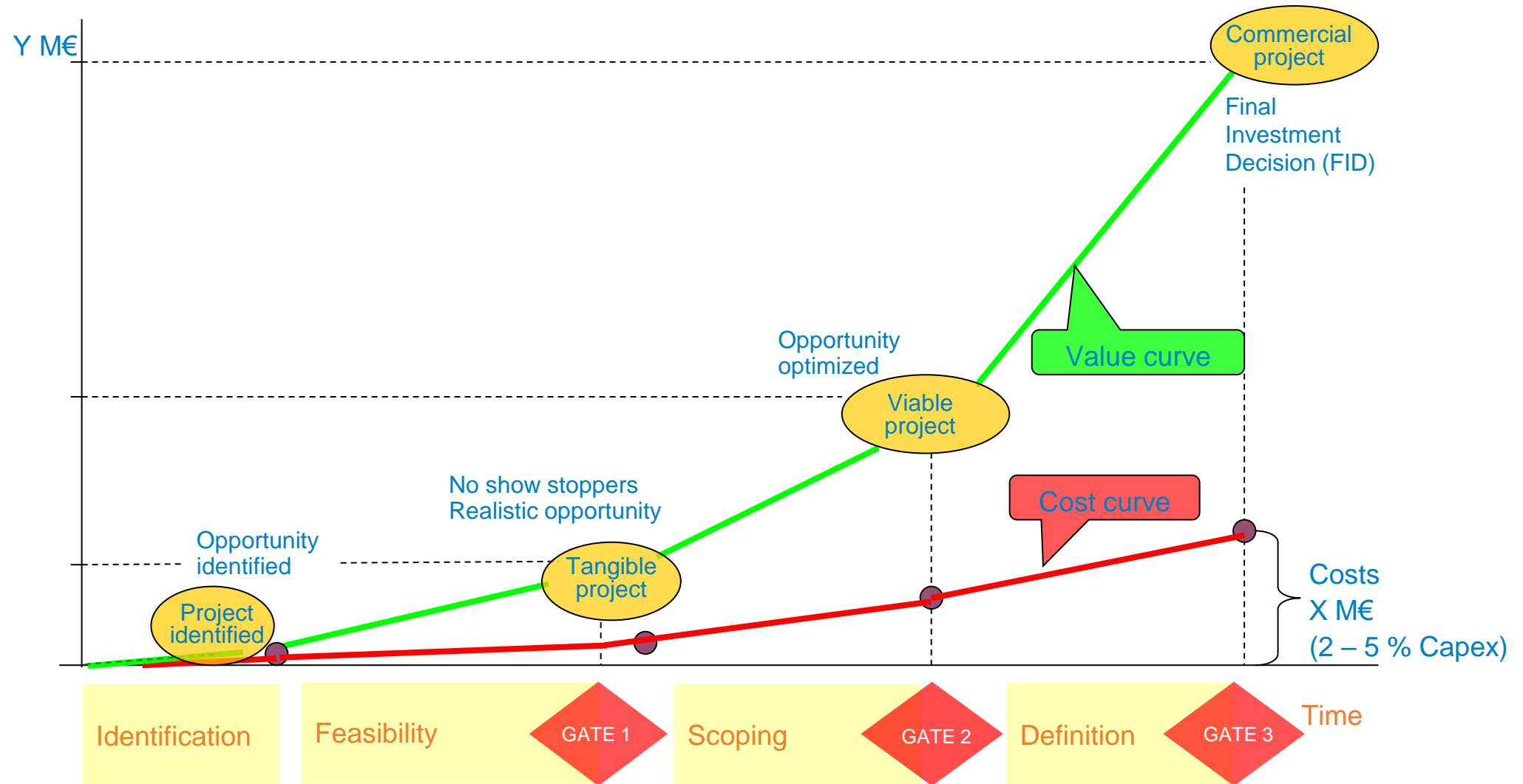


# Investors, banks, funds and credit agencies

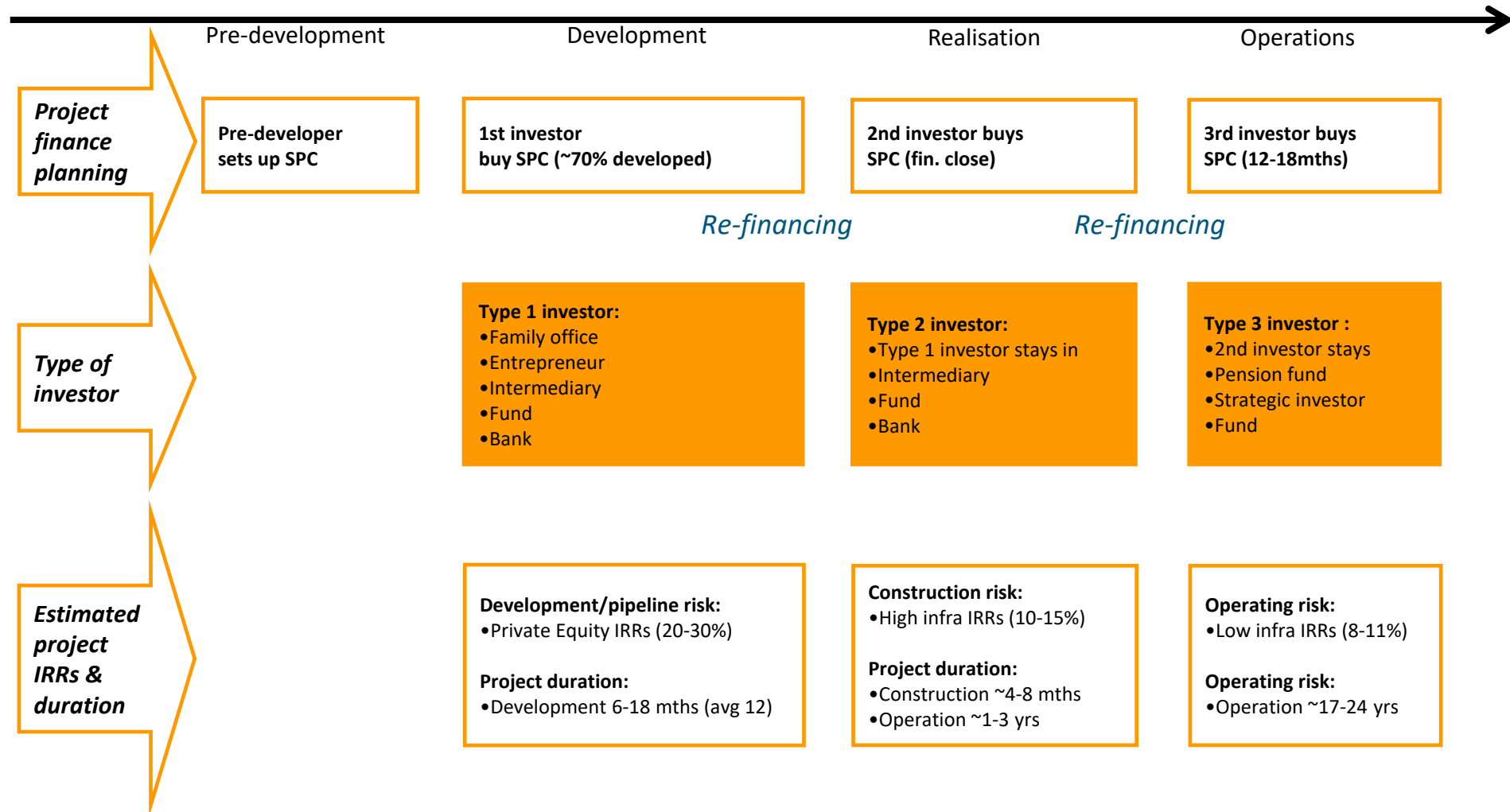


**Different financiers** may target **different positions at different stages** in the capital structure of a renewable energy project dependent on their experience and risk appetite

# Value creation during project development RE project



# Different project stages – different financiers





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# Hydropower project Albania - Risk Assessment



Hydropower Project

## Hydropower project

- Location: Albania – remote area
- Capex: 30 Million Euro
- DD Client: EBRD
- Timing: financial close next month
- Technology supplier: Andritz and local partner
- Potential landslides
- Local community expects local benefits

# Due diligence team - Risk Assessment

Risk  
.....

Risk  
.....

Risk  
.....

Risk  
.....



Hydropower Project

Risk  
.....

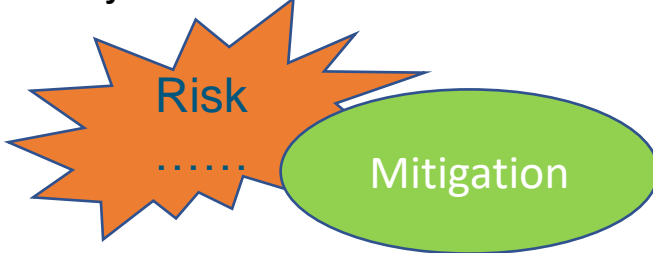
Risk  
.....

Risk  
.....

# Due diligence team - Risk Assessment



Hydropower Project



# Due diligence team – Risks & mitigation measures

- Identify project risks from an investor point of view
  - Risks regarding completion
  - ....
  - ....
- Identify mitigation measures
  - Mitigation measures for completion risks
    - Turnkey contract with liquidated damages (penalties, bonds)
    - Contingency reserve account
    - Definition of ‘completion’

# 16 categories of risks:

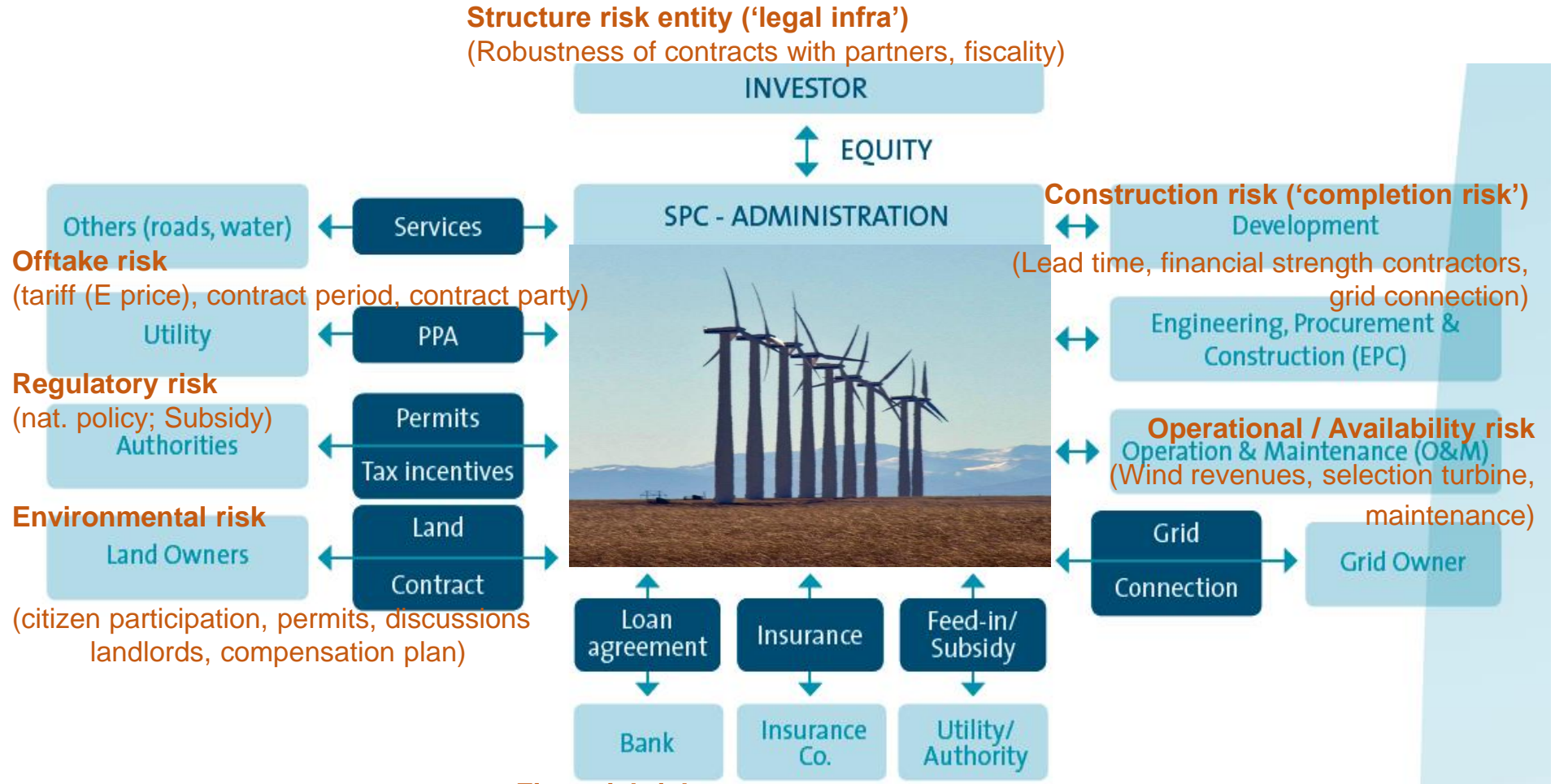
- Operating (technical, cost, management)
- Completion
- Supply
- Market
- Infrastructure
- Environmental
- Participant
- Political
- Force Majeure
- Foreign Exchange
- Engineering
- Syndication
- Funding/Interest
- Legal



# Due diligence team – Risks & mitigation measures

- Legal risks
  - Enforceability contract clauses
  - Restrictions on foreign ownership and control
  - Change of law or policy
- Market
  - Power purchase agreement → off take risk
  - Take and-pay contracts vs Take-or pay contracts (“Come hell or high water clause”)
- Political (citizen opposition)
  - Requirement of local participation
  - Requirement of local formation of a project company

# Wind energy project Ukraine

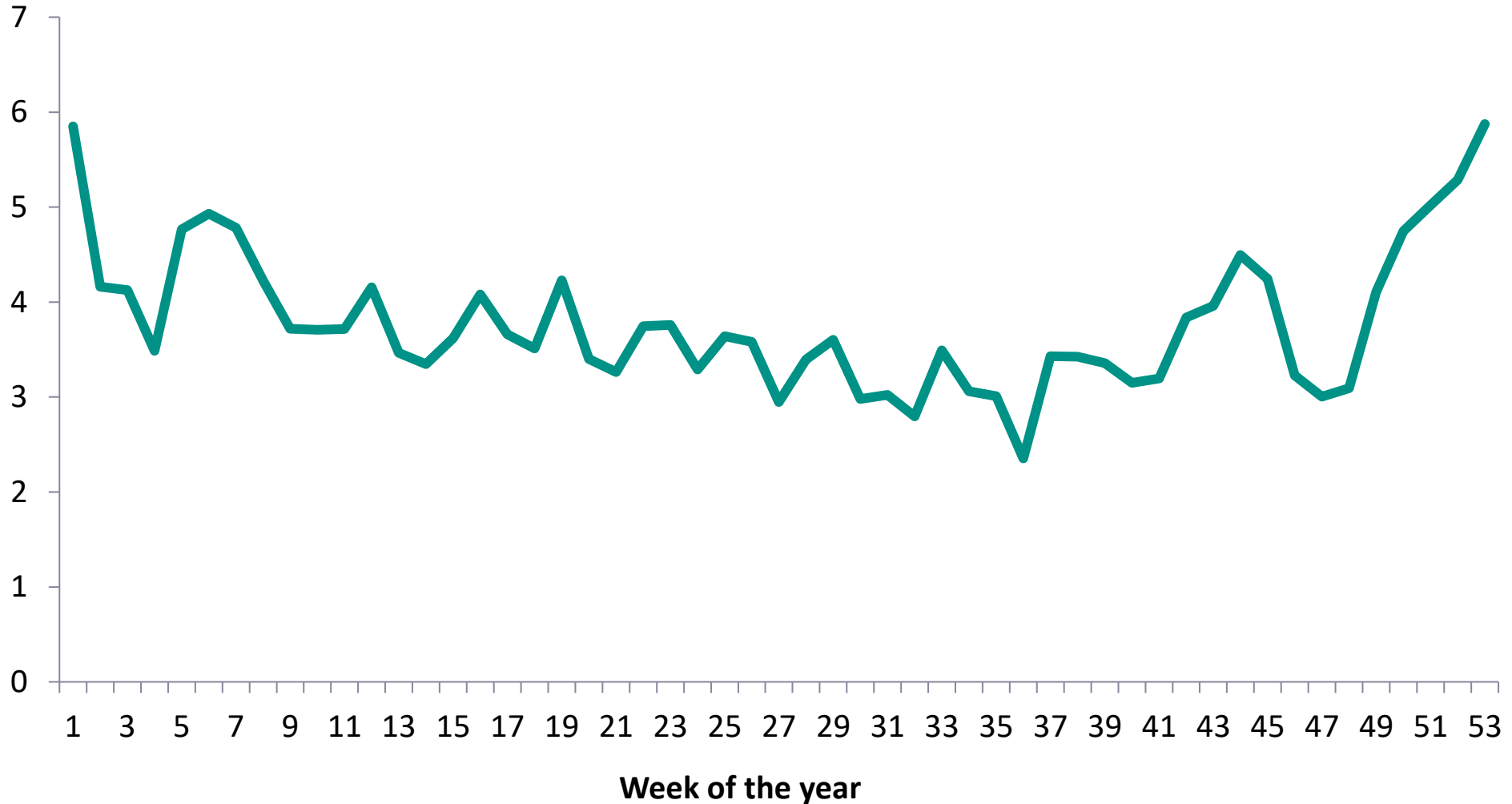


## Financial risks

- Inflation, interest, fiscality
- Currency risk: investment in currency X vs. revenues in currency Y

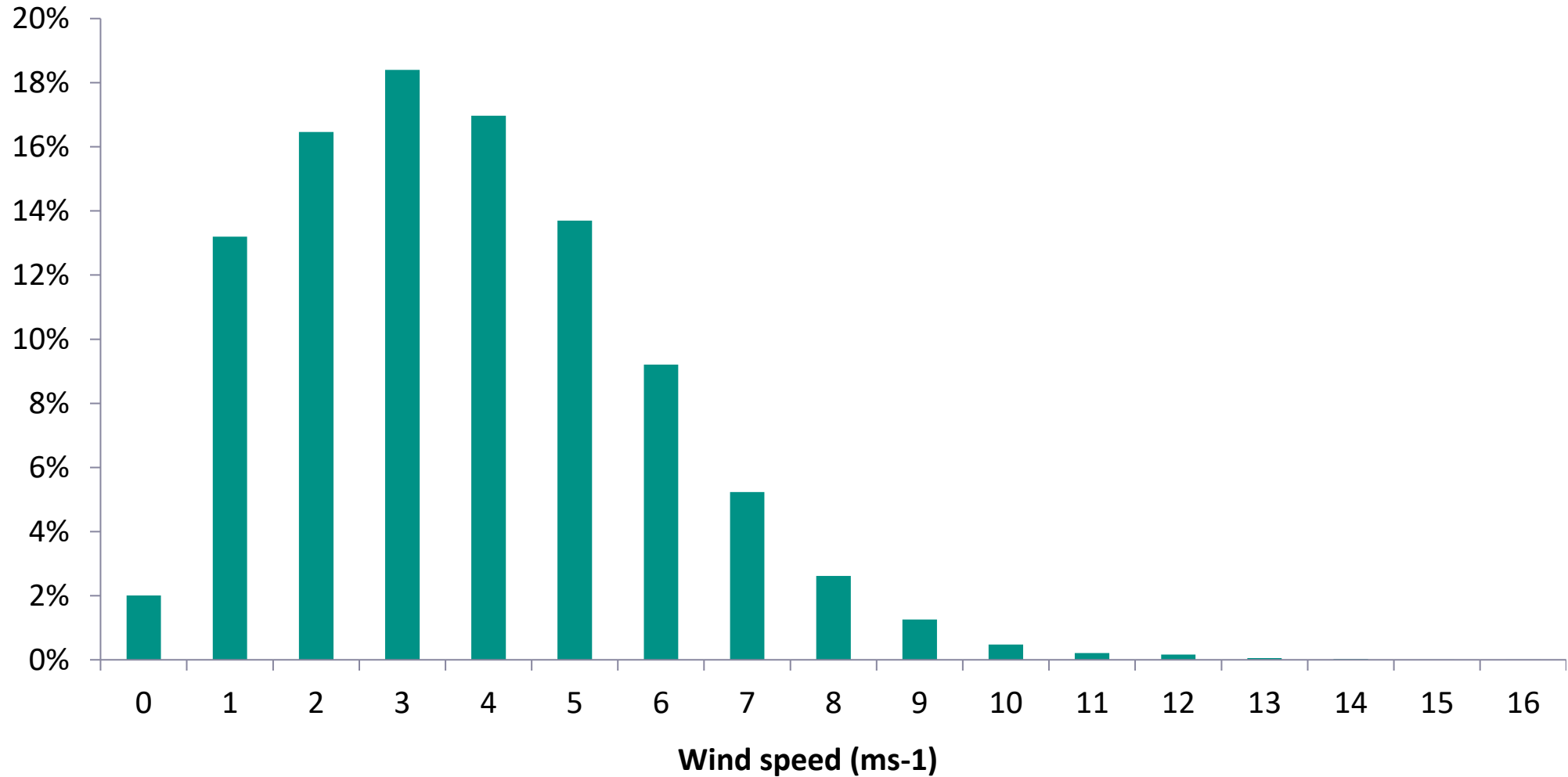
# Average wind speed per weekday

Wind speed (ms-1)

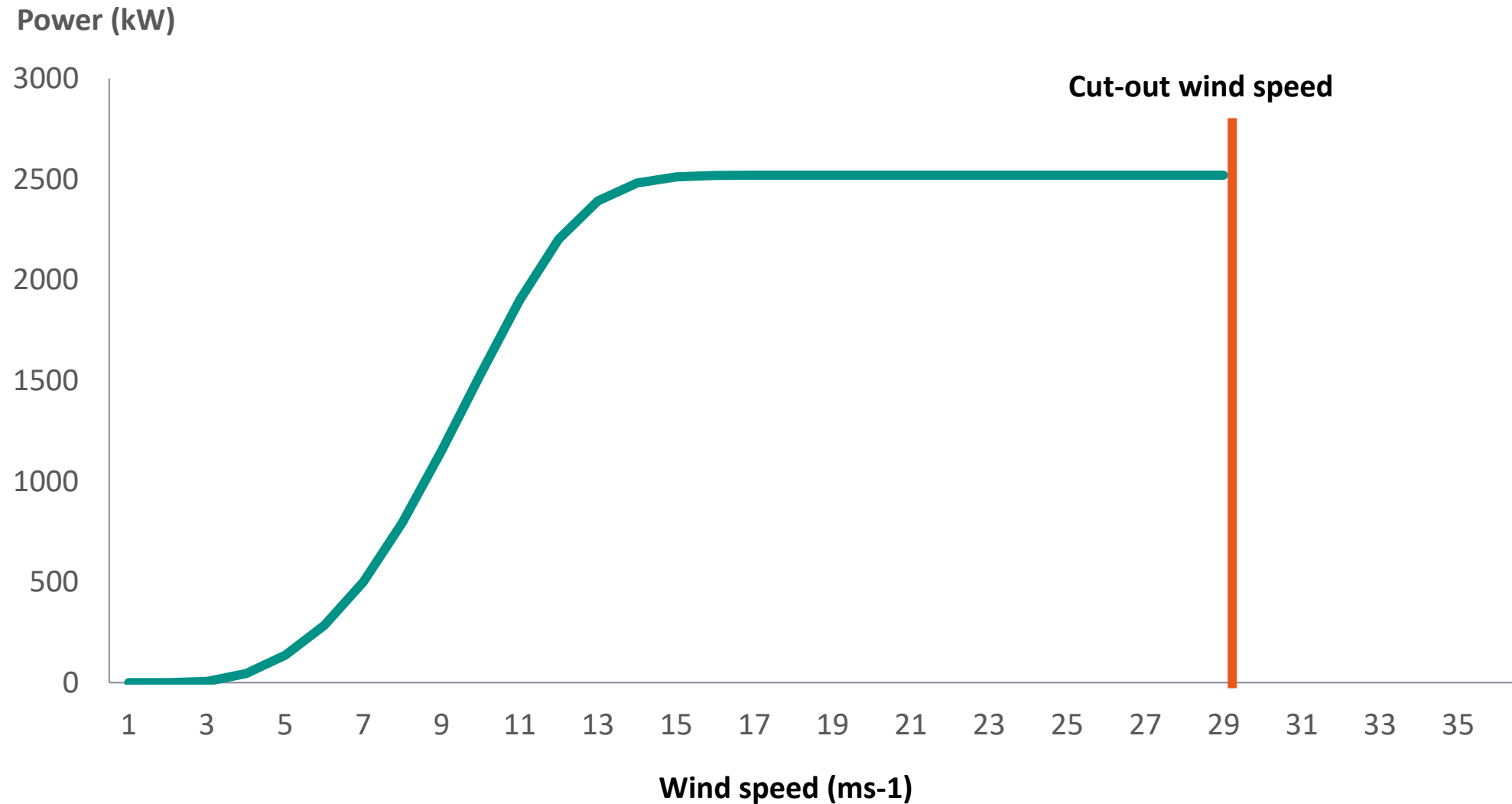


# Historical wind distribution

Historic occurrence



# Wind power curve for a turbine

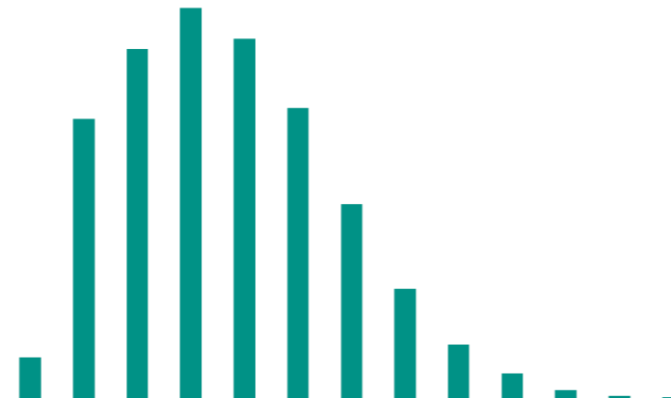


# Estimation of expected annual energy yield

Energy yield =



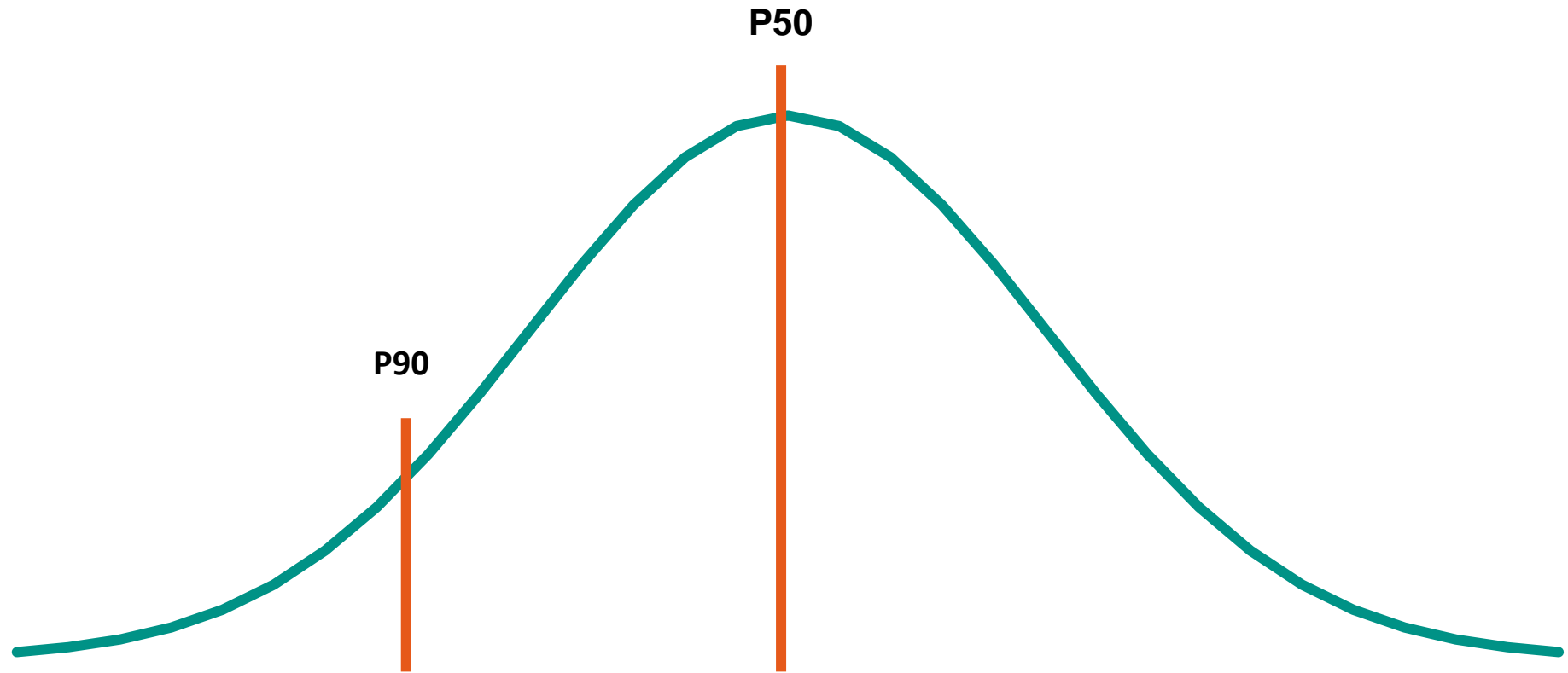
X



Dependent on wind turbine  
Different safety margins per supplier

- Geographically specific
- Site specific
- Intrawindpark effects
- Reliability of measurements

# Power production probability distribution



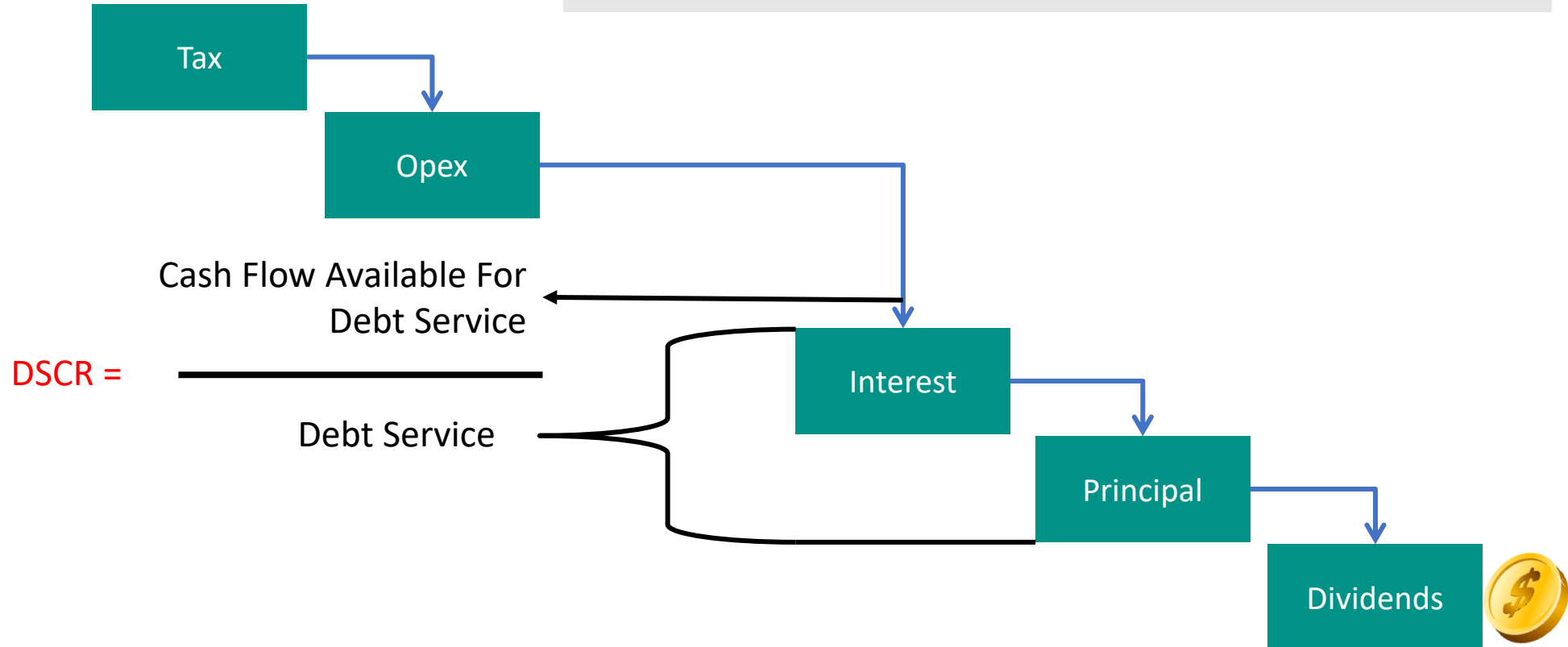
Debt financier's models might size the debt based on a P90 production estimate for instance at a 1.20 **Debt Service Cover Ratio**



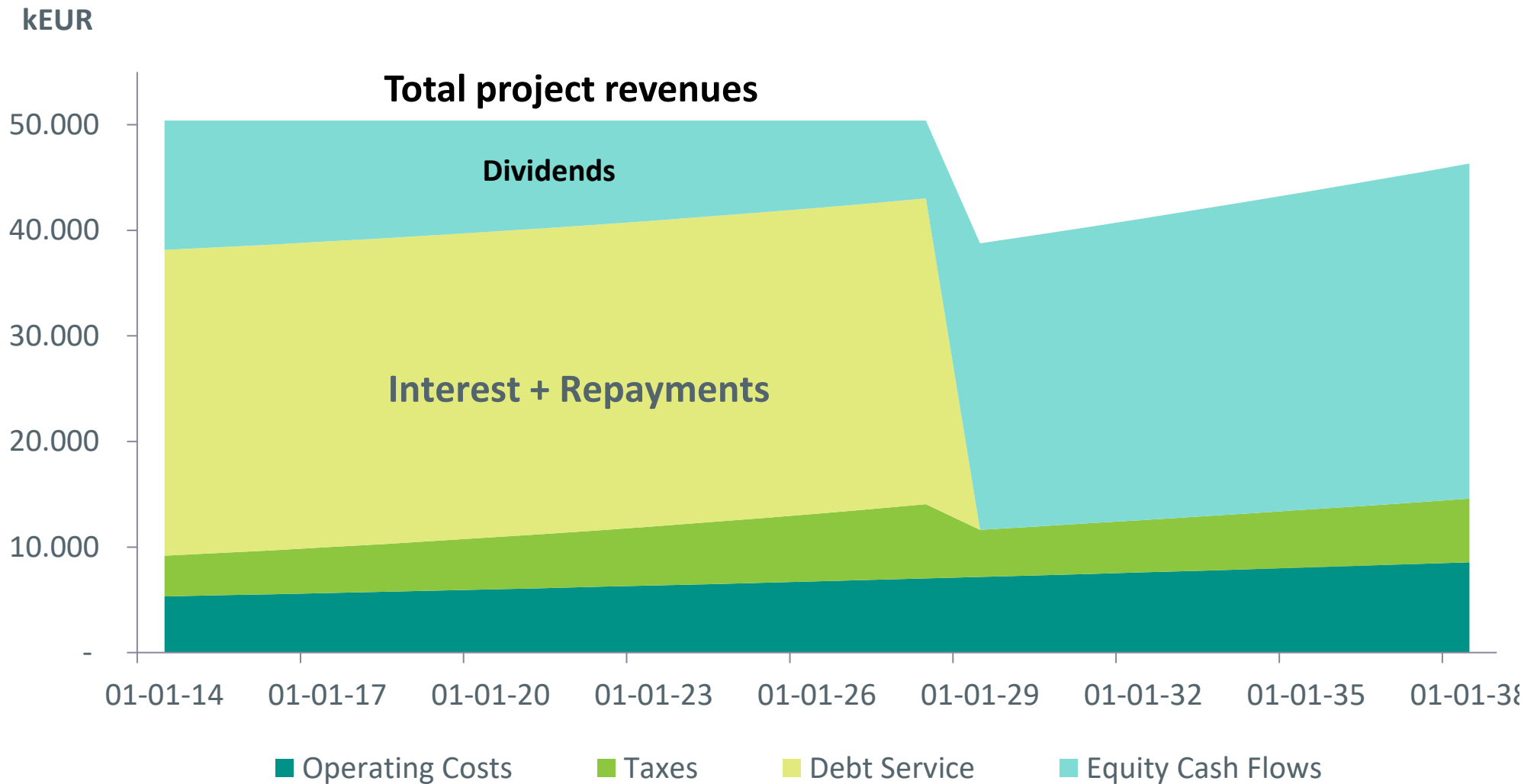
# Cash Flow Waterfall and DSCR calculation



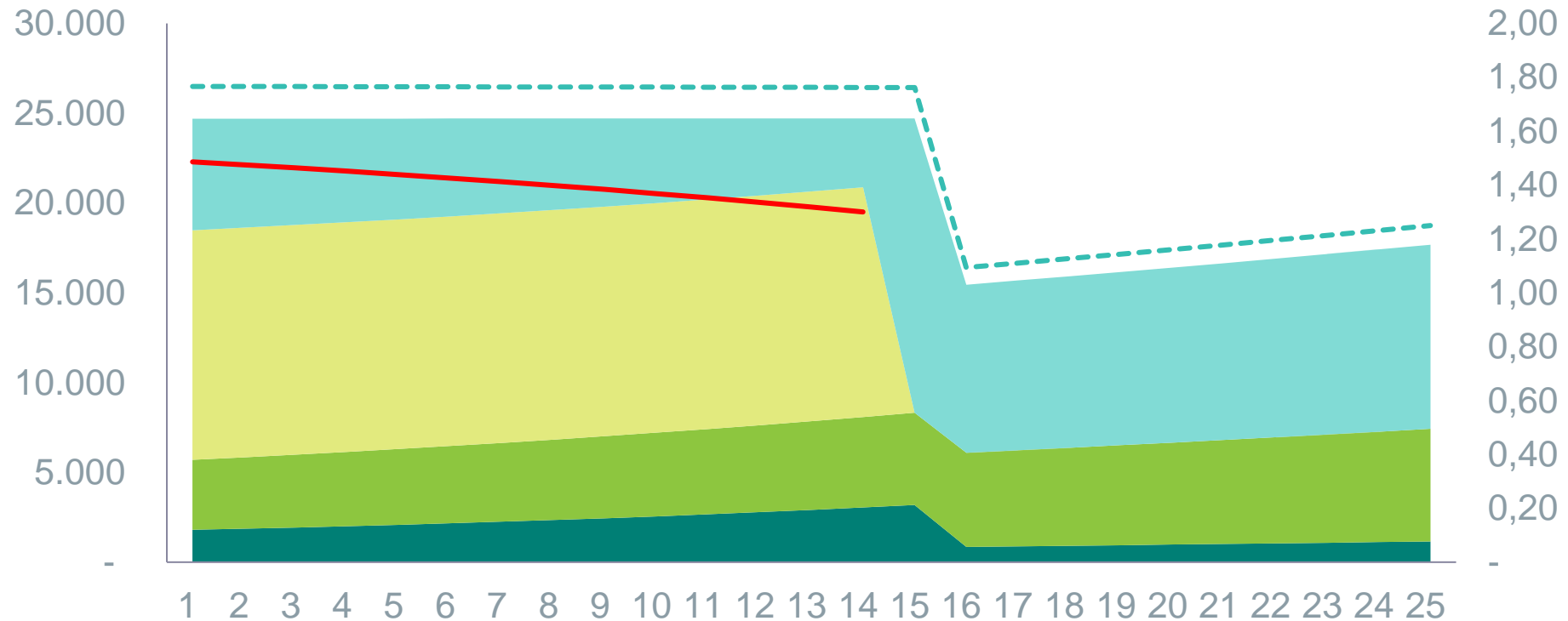
**Debt Service Cover Ratio** is an important ratio used by banks for determining debt capacity of a project



# Illustrative cash flow overview of a wind project



# Project financials: base case

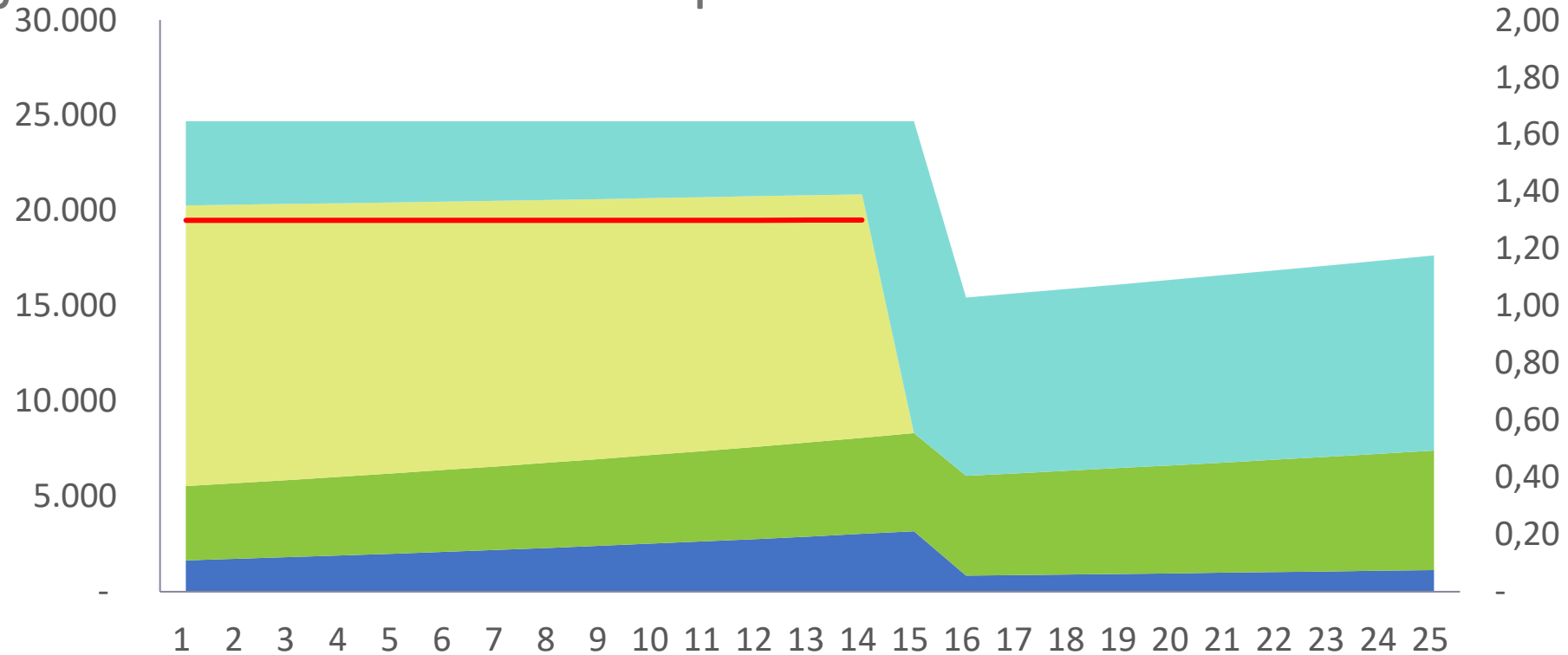


Following Assumptions:

- Annuity Profile
- P90 at 1.30x minimum DSCR

	P50	P75	P90
Maximum Leverage	79.23%	75.36%	71.68%
Internal Rate of Return	18%	14%	11%

# Project financials: sculpted debt case



- Following Assumptions:
  - Sculpted Repayment Profile
  - P90 at 1.30x minimum DSCR

	P50	P75	P90
Maximum Leverage	92.72%		78.23%
Internal Rate of Return	22%		13%

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### **Leon Pulles**

Senior Investment Advisor

*Mobile:* +31 6 46 36 34 81

*Email:* [leon.pulles@energy-im.nl](mailto:leon.pulles@energy-im.nl)

*Linkedin:* [www.linkedin.com/in/leonpulles](http://www.linkedin.com/in/leonpulles)

### **Csinszka Flora Bene**

Manager East meets West Network

Consultant at Trinomics, V4SDG

*Mobile:* +36 70 375 7001

*Email:* [csinszka.bene@energy-im.nl](mailto:csinszka.bene@energy-im.nl)

*Linkedin:* [www.linkedin.com/in/csinszka-flora-bene](http://www.linkedin.com/in/csinszka-flora-bene)

### **Denisa Kasa**

Program manager

*Mobile:* +31 6 83 24 21 81

*Email:* [denisa.kasa@energy-im.nl](mailto:denisa.kasa@energy-im.nl)

*Linkedin:* <https://www.linkedin.com/in/denisa-kasa-a82833151/>

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