ETIP Ocean:
A Primer on Project Finance

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Agenda

1. **Introduction to Project Finance**
2. Risk Management as central activity in Project Finance
3. Means to reduce financial risks, cash-flow waterfall and important ratios

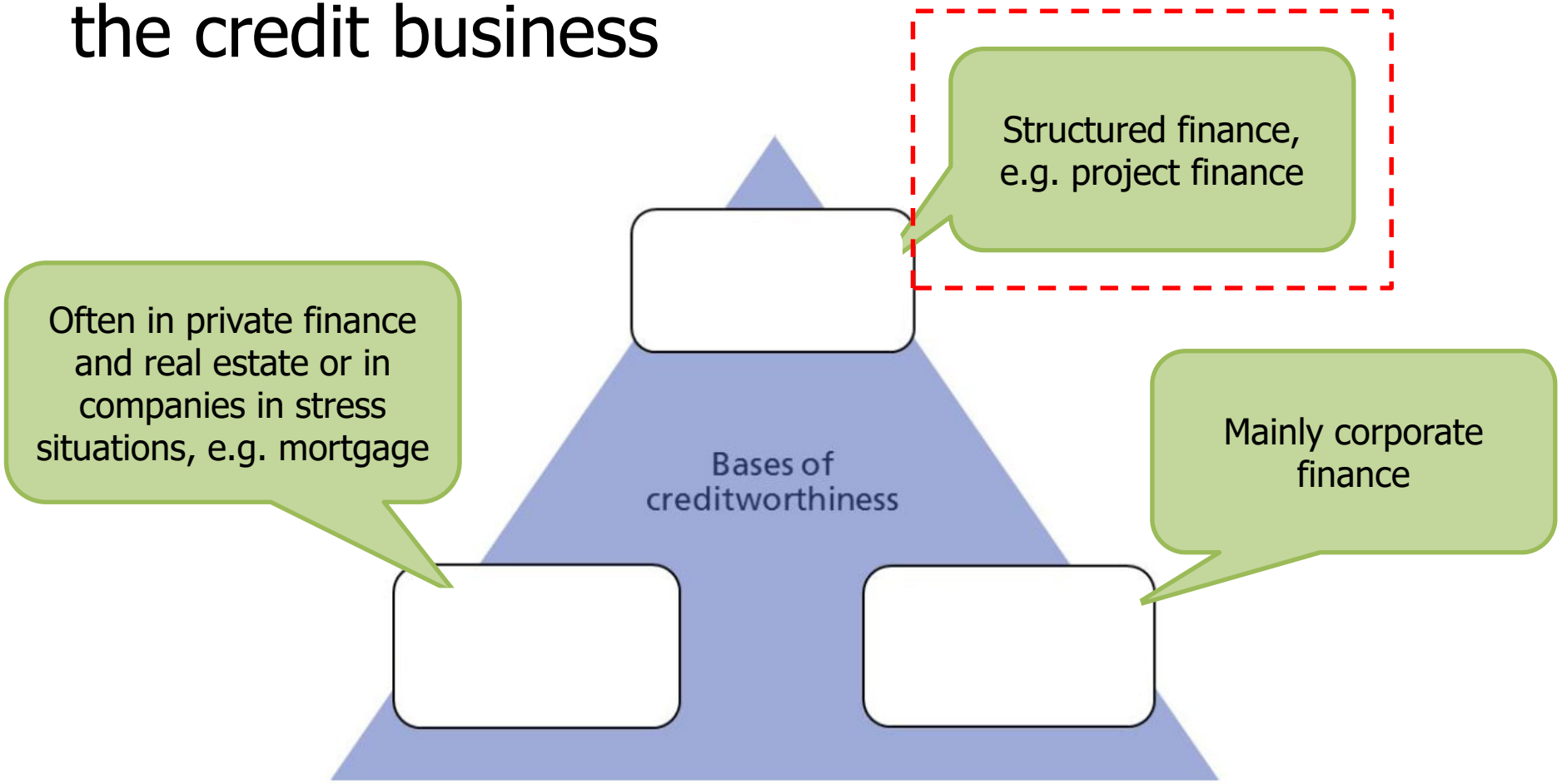
Case background

You are the small project developer Tidal Projects Ltd. You have identified, secured and consented a good 5MW site in the Bay of Fundy. Due to the excellent site condition, you expect on average 3.000 full-load hours per year, i.e. an AEP of 15GWhs. Your technology of choice from ABC Tidal Ltd. is fully certified by renowned certifiers and has also successfully passed the technical due diligence by EIB. Moreover, the existing prototypes have significant experience with high reliability numbers over the last few years.

The COMFIT scheme in Nova Scotia provides you with a feed-in tariff for tidal totaling 530 CAN$/MWh. You have the choice to finance the project all equity. The equity provider expects 12% p.a. return on the funds provided. Based on the CapEx and OpEx you have negotiated hard with ABC Ltd., you calculate the LCOEs and discover 590 CAN$/MWh of which more than 40% are pure financing costs. If you could bring in 30% of debt at an interest rate of 5%, the LCOE target could be met.

But why and under which conditions should anybody lend Tidal Projets Ltd. with a very small balance sheet in the order of 10-15 MCAN$?

Three different bases of credit worthiness in the credit business



Source: Frankfurt School, FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, „Certified Expert in Climate & Renewable Energy Finance", Module 7, p.31

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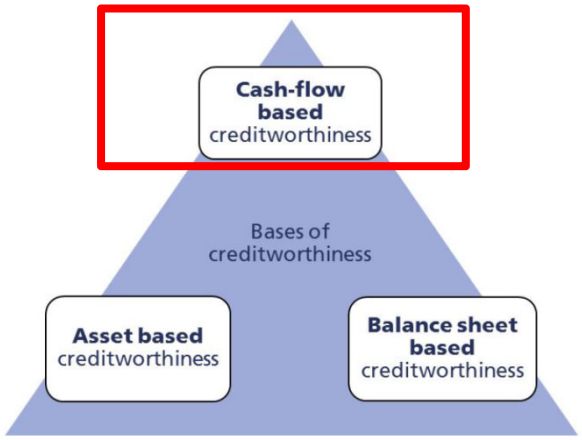
“Project finance” has no unanimous definition

Nevitt, Fabozzi:

"A financing of a particular economic unit in which a lender is satisfied to look initially to the cash flow and earnings of that economic unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan.”

Characteristics of Project Finance



- Financing does not depend on creditworthiness of the individual sponsors (balance sheet related finance)
- Financing does not depend on assets a project sponsor makes available as collateral (asset related finance)

"Project Finance is the structured financing of a specific economic entity – the SPV, special purpose vehicle, also know as the project company – created by sponsors using equity or mezzanine debt and for which the lender considers cash flows as being the primary source of loan reimbursement …"

Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2013, p. 2

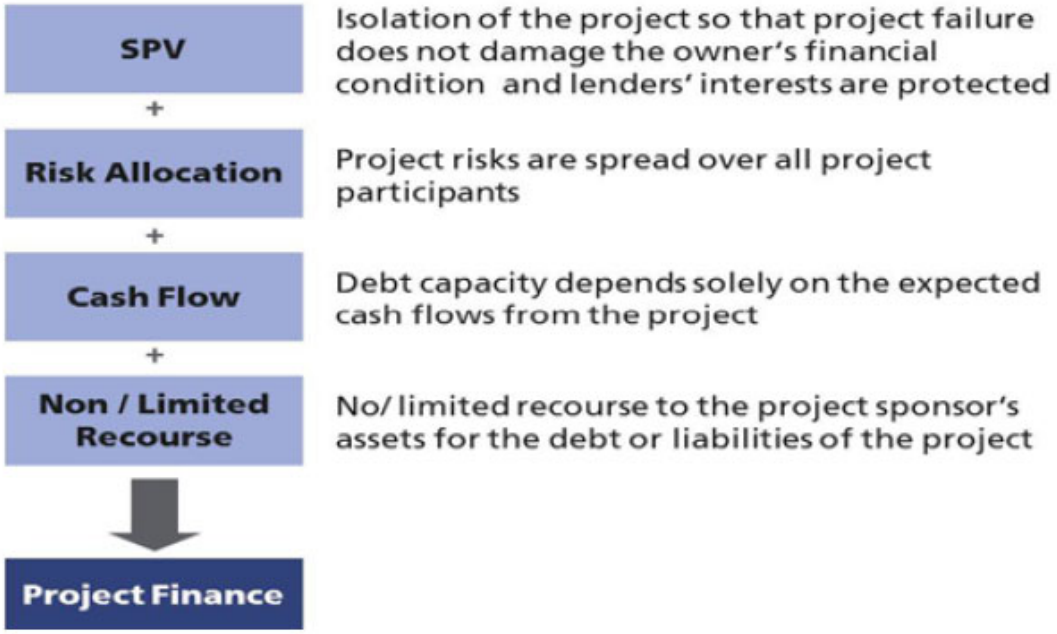
Starting point of project finance is a circumscribable project

Criteria

1. Singular and acyclic project:
    - Project parties sign a bundle of contracts for a one-off project with the SPV
    - Target: Consider all eventualities (project-risks) explicitly
2. Clearly terminated project: Reduces risks of contractual incompleteness
3. Specifically defined targets
    - Project sponsors usually with different targets ⇨ Necessity to define overarching project targets
    - Important: All employees of SPV have to follow the SPV's (not their company's) targets.
4. Defined financial, personal and material resources: Avoid mixing of individual sponsors' targets with SPV targets due to diffuse division of resources

Financing a project ≠ Project Finance

Four key ingredients of a Project Finance structure



Source: Frankfurt School, FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, „Certified Expert in Climate & Renewable Energy Finance", Module 7, p.34

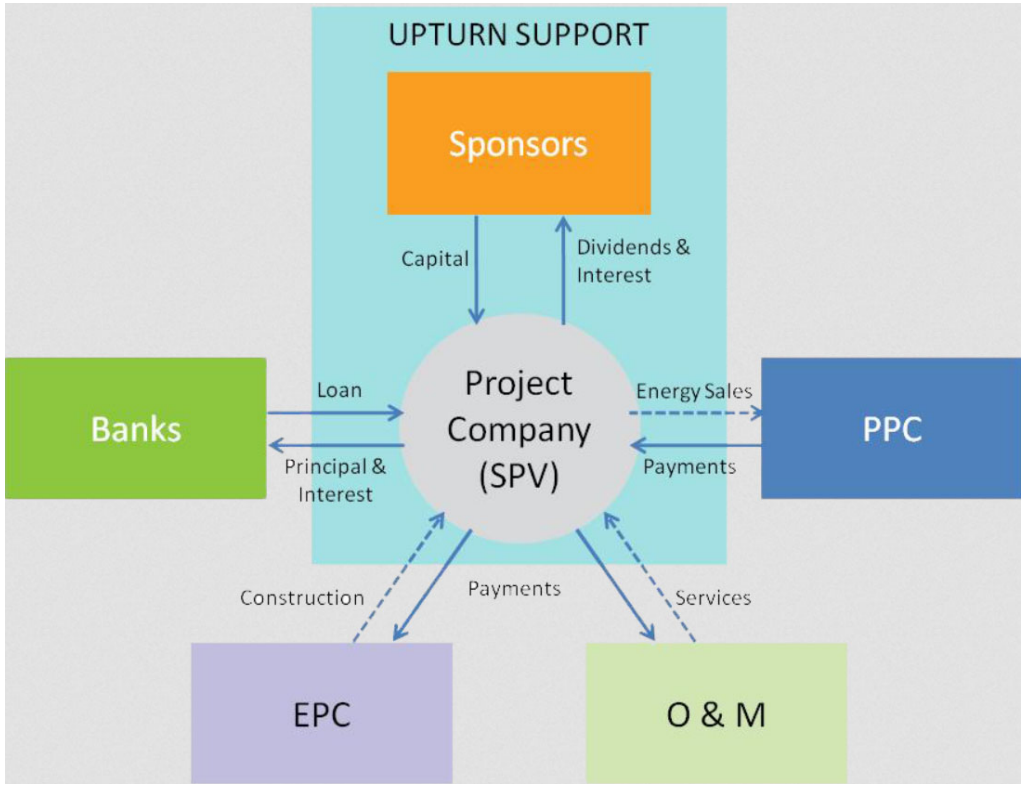
Backup

The Special Purpose Vehicle (SPV) as center of the financing structure (I)

"A special purpose vehicle (SPV) project company with no previous business or record is necessary for project financing. The company's sole activity is carrying out the project by subcontracting most aspects through construction contract and operations contract. Because there is no revenue stream during the construction phase of new-build projects, debt service is possible during the operations phase only. For this reason, parties take significant risks during the construction phase. Sole revenue stream is most likely under an off-take or power purchase agreement. Because there is limited or no recourse to the project's sponsors, company shareholders are typically liable up to the extent of their shareholdings. The project remains off-balance-sheet for the sponsors and for the government."

Source: http://www.investopedia.com/terms/p/projectfinance.asp#ixzz4wKux36hB

The Special Purpose Vehicle (SPV) as center of the financing structure (II)



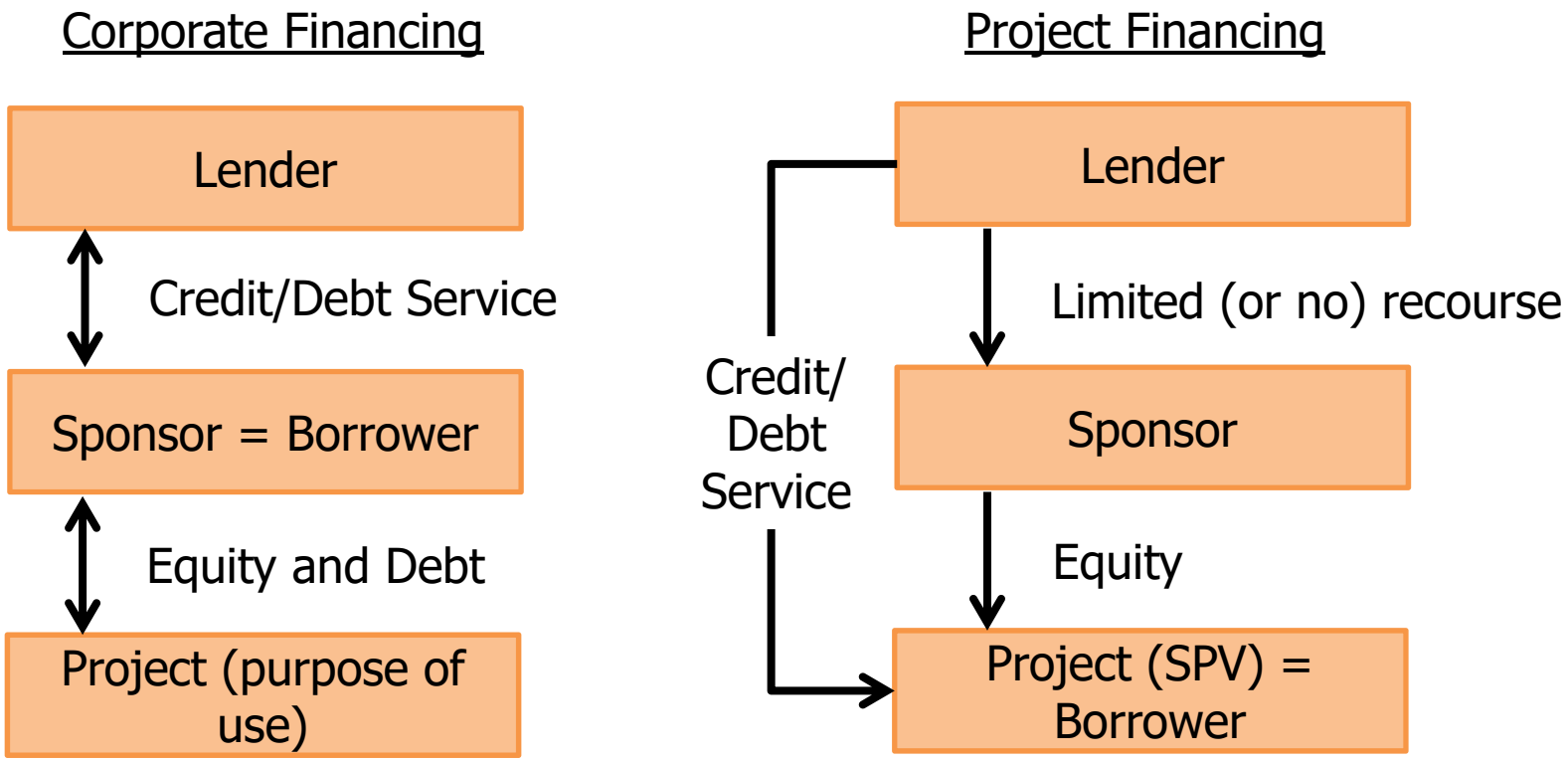
Source: http://www.upturn.gr/uploads/editor/financing.png

Project finance clearly distinguishes from a corporate financing

Three general elements of project financing

1. Cash-Flow Related Lending
   - Provision of debt related to a project cash flow
   - Check of credit worthiness based on expected cash flow development of a project
   - Quantifiable risks are assessed with scenario- and simulation analyses
2. Principle of risk sharing between project partners: Each project partner assumes parts of the total risk according to their expertise
3. Project debt in books of project company (Off-Balance-Sheet-Financing ⇨ maximum share <50%)
   - Debt of SPV usually do not appear in the balance sheets of the project sponsors (Rating!)
   - But: Market has a solid overview of project financing in place

Significant difference in liability



Source: Reproduced and translated from J. Böttcher, "Finanzierung von Erneuerbare-Energien-Vorhaben", Oldenbourg 2009, p. 27

Project financing deals are "Off-Balance Sheet"

On balance sheet
„corporate financing"

- Sponsors use all assets and cash flow of existing firm to guarantee for a credit
- Relatively simple to structure
- Affects credit rating

Off balance sheet
„project financing"

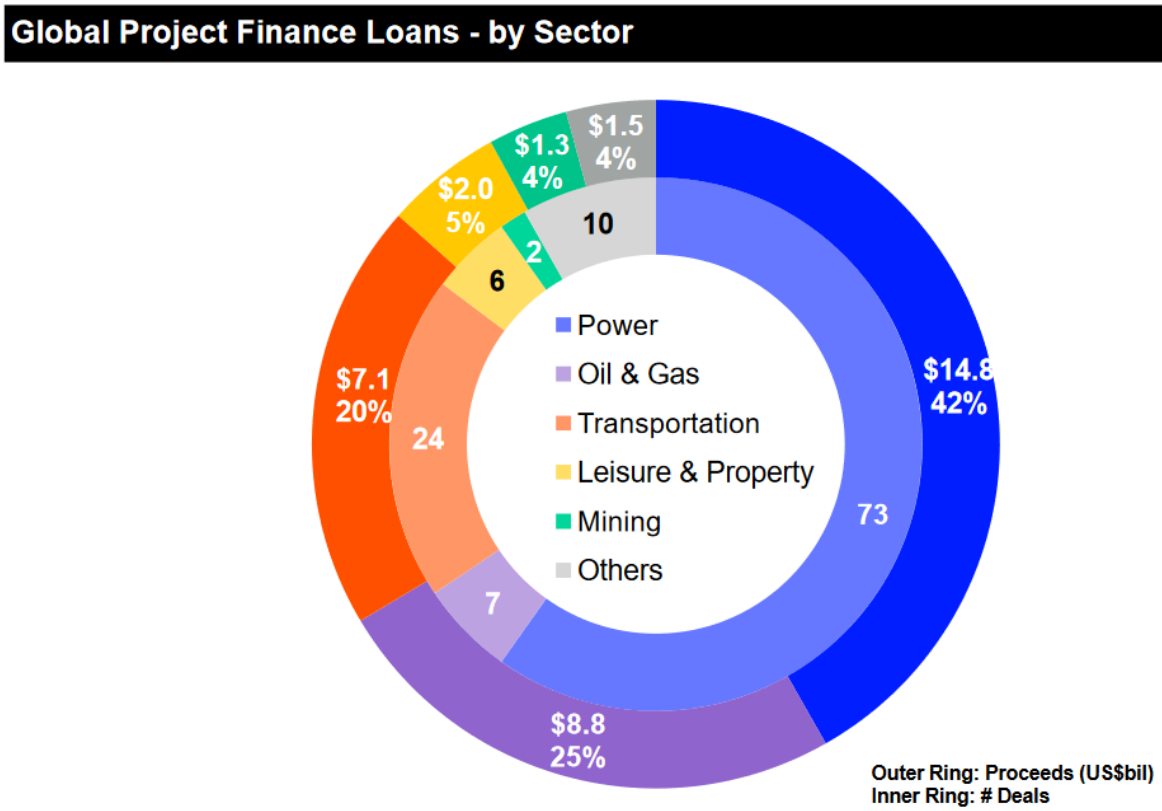
- Only cash flows (and assets) of the SPV are used to guarantee for the credit
- Deal structuring costly (5-10% of total investment) and complex (intense due diligence, high monitoring effort etc.)

Project financing is not a new invention ...

"... Roman and Greek merchants used project financing techniques in order to share the risks inherent to maritime trading. A loan would be advanced to a shipping merchant on the agreement that such loan would be repaid only through the sale of cargo brought back by the voyage (i.e. the financing would be repaid by the 'internally generated cash flows of the project', to use modern project financing terminology) ..."

Source: D. Gardner, J. Wright, "Project Finance", HSBC: https://www.hsbcnet.com/gbm/attachments/products-services/financing/project-finance.pdf

Project Finance is an essential financing vehicle for the energy sector (1st Qtr 2019)



122 deals with a total value of USD 35,5bln

Source: REFINITIV, „GLOBAL PROJECT FINANCE REVIEW – First Quarter 2019 - MANAGING UNDERWRITERS", 2019

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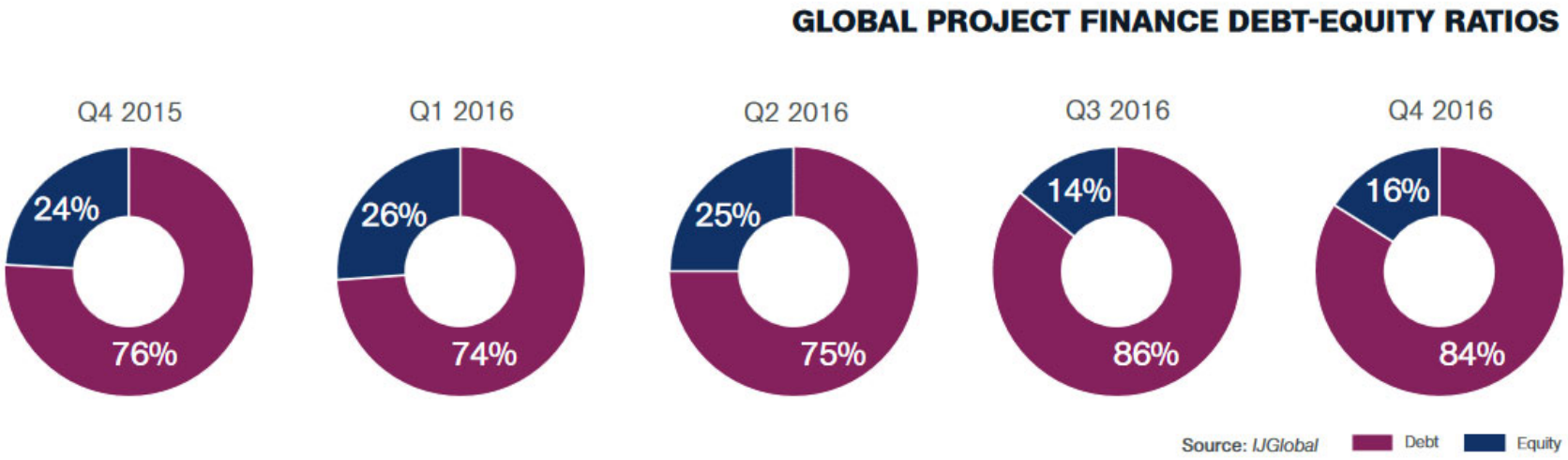
Project Finance talks “big money”

GLOBAL TOP PROJECT FINANCE TRANSACTIONS

Sector	Transaction	Value ($m)	Location	Financial Close
Oil & Gas	Yamal LNG	30,249	Russia	25/06/2016
Oil & Gas	Tengizchevroil Expansion	16,000	Kazakhstan	27/07/2016
Transport	Port of Melbourne Privatisation	7,380	Australia	31/10/2016
Mining	Oyu Tolgoi Copper-Gold Mine Expansion	5,801	Mongolia	06/05/2016
Oil & Gas	Dakota Access Pipeline	4,740	United States	01/08/2016
Power	Central Java Coal-Fired Power Plant (2,000MW) PPP	4,300	Indonesia	07/06/2016
Transport	La Guardia Airport Central Terminal Building PPP	3,810	United States	01/06/2016
Renewables	Beatrice Offshore Wind Farm (588MW)	3,794	United Kingdom	20/05/2016
Oil & Gas	Tangguh LNG Expansion	3,745	Indonesia	14/12/2016
Power	Facility D Desalination Plant IWPP (2,400MW)	2,969	Qatar	11/04/2016

Source: IJGLOBAL,“Full Year 2016 Global Project Finance League Tables”, 2017

Debt to Equity ratio lately appears to increase strongly



Source: IJGLOBAL,"Full Year 2016 Global Project Finance League Tables", 2017

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"... while the aim of Project Finance is to foresee every possible future risk ex ante in order to limit the behaviours of management (i.e. in the SPV) and block the use of funds for different purposes"

Stefano Gatti

Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2013, p. 46

Risk Management is the core duty of the SPV

Core to a Project Finance deal is that:

A Cash Shortfall means, that the project is technically in default

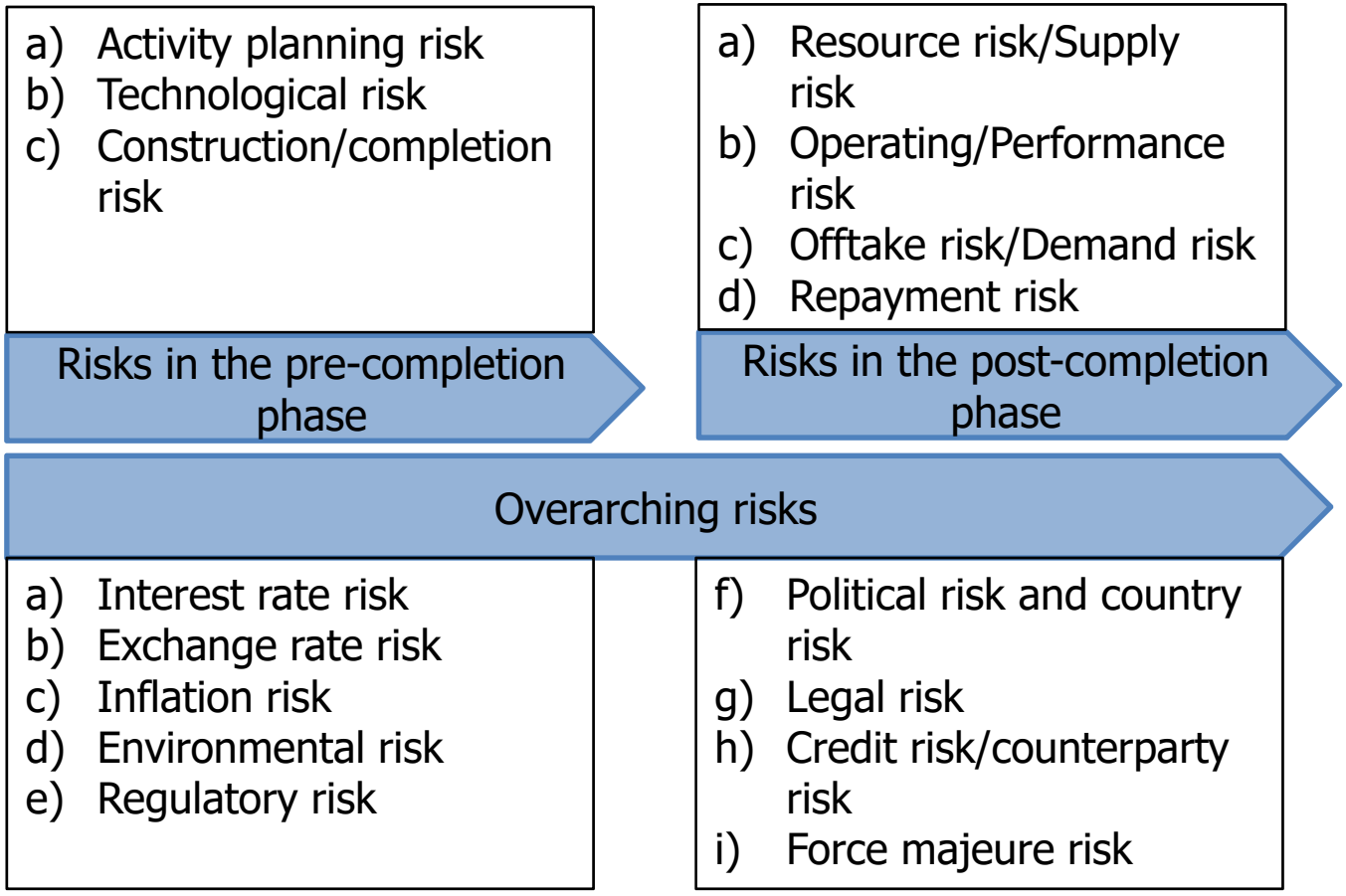
Three generic strategies to minimize the risk of cash shortfalls

1. Retain the risk
2. Transfer the risk by allocating it to one of the key counterparties
3. Transfer the risk to professional agents whose core business is risk management (i.e. insurers)

Strategy 1 can have disastrous effects on the SPV – Strategy 2 is key to Project Finance and Strategy 3 is used on a need-be basis

Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2013, p. 43

The amount of risks to be managed within a project finance deal is huge



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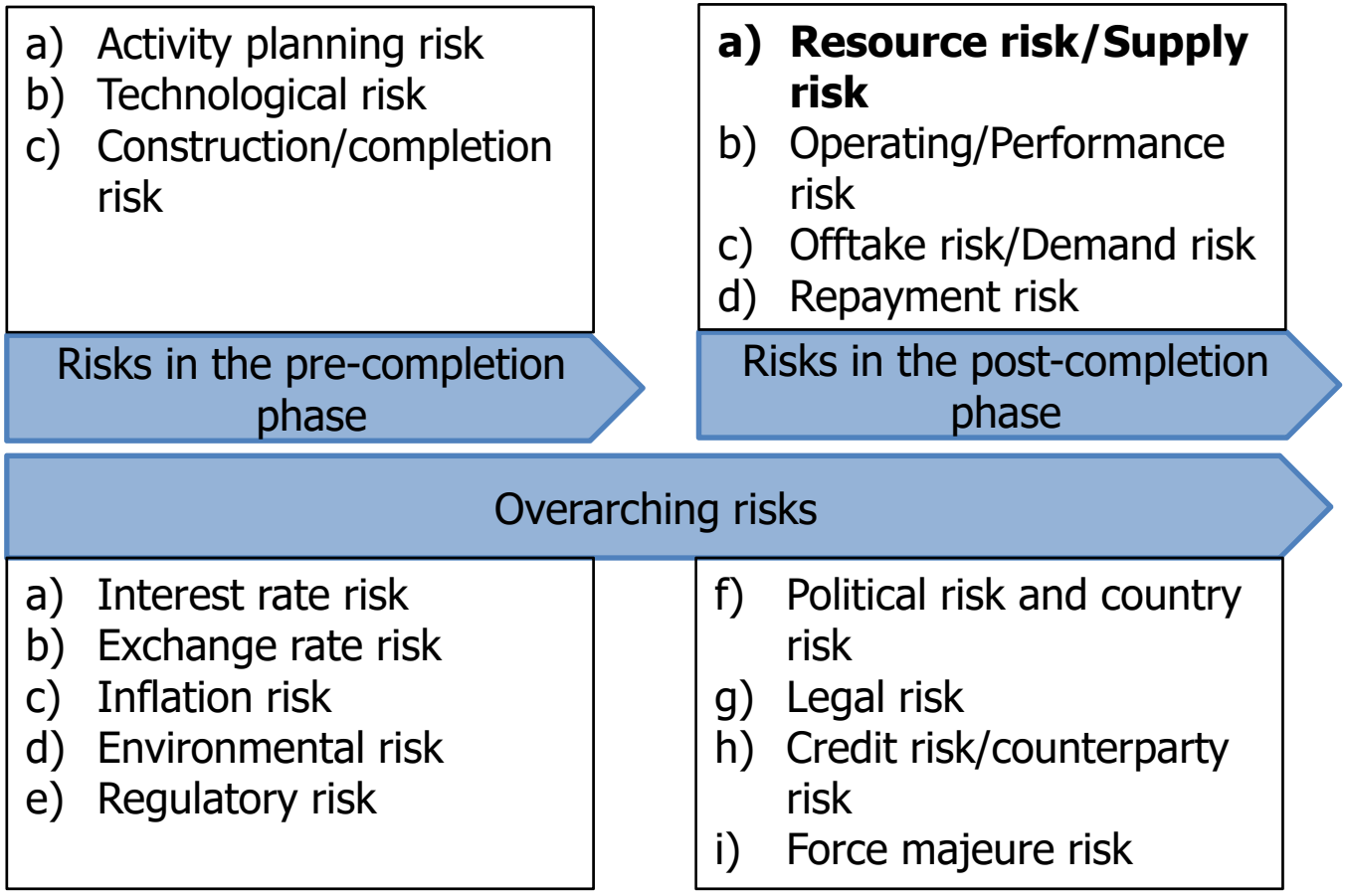

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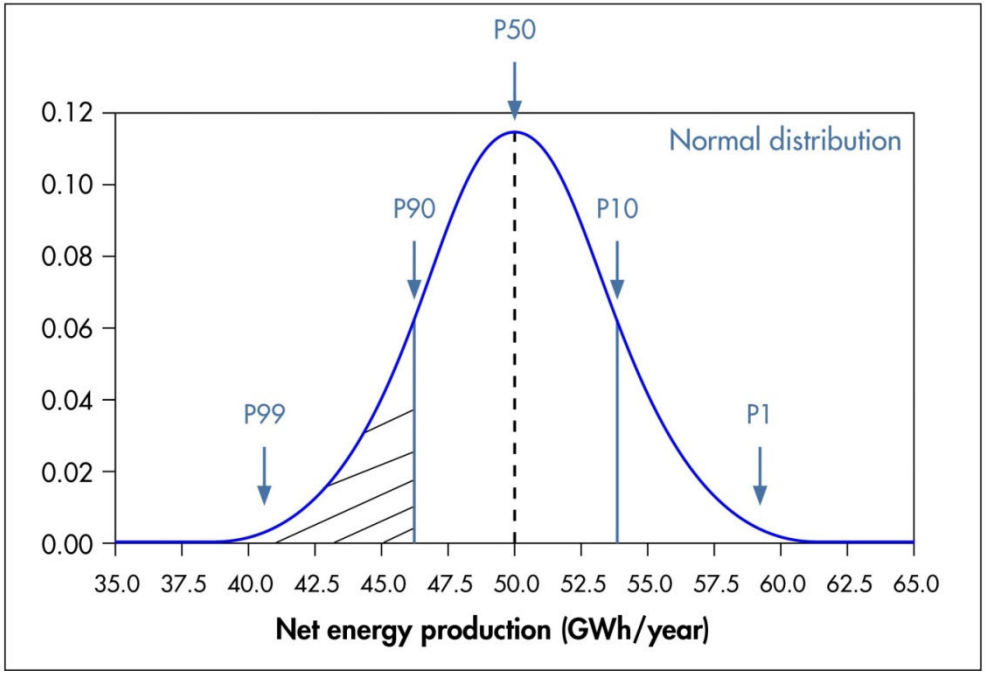
P90 values for energy conversion result in a discount of cash flows from energy sales

a) <u>Resource Risk of fluctuating renewable energy sources:</u>



Source: https://www.awstruepower.com/implications-resource-assessment-uncertainty-project-finance/

Project Finance requires security on the supply side

a) Resource Risk:

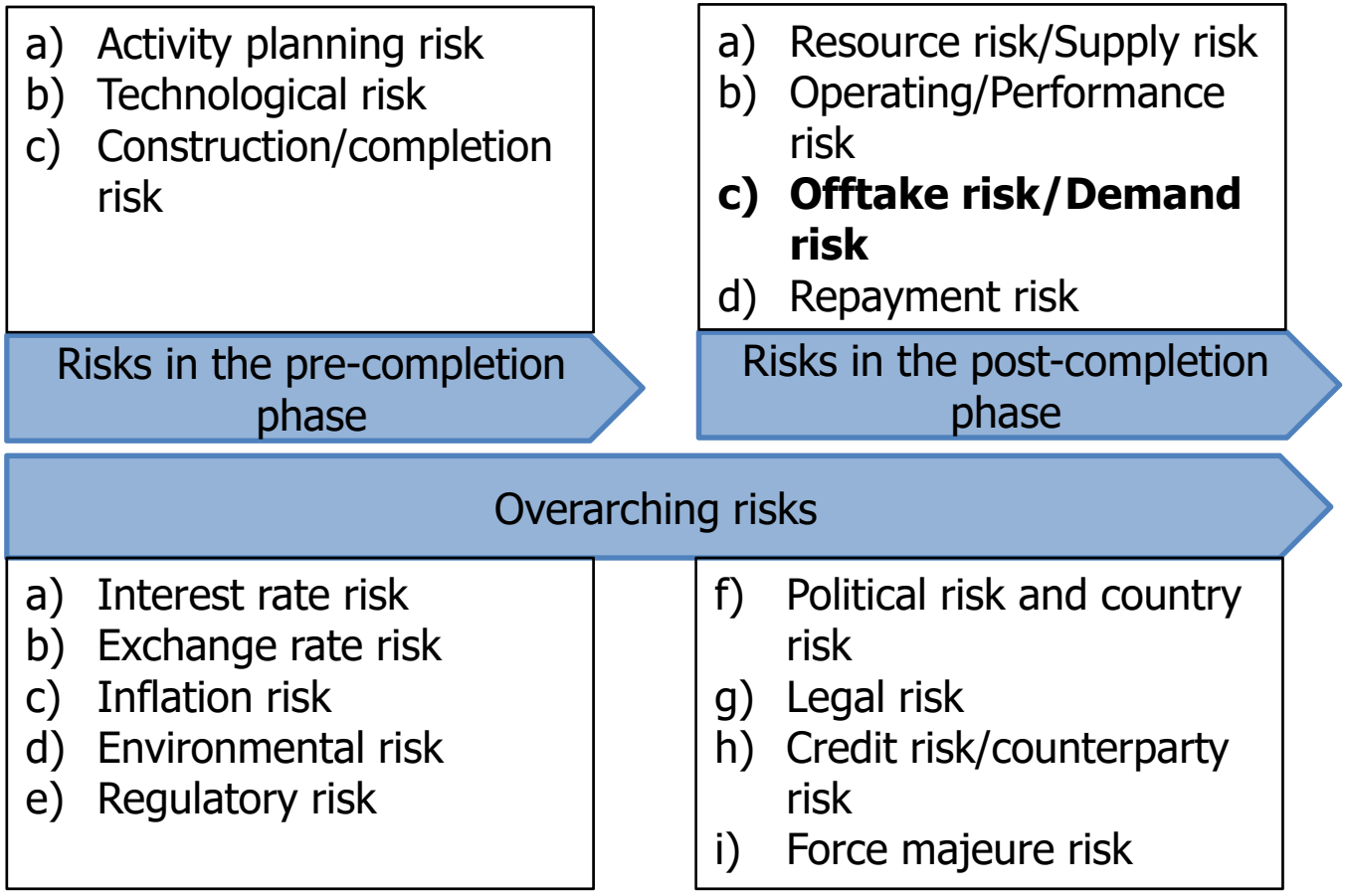
Resource risk: A renewable energy project (e.g. wind farm) relies on statistically fluctuating resources. Hence, the project cash flows will also fluctuate and there is no absolute safety that the resource will be there in each individual planning period of the SPV

Mitigation

For fluctuating renewables banks usually require P75 or P90 in cash-flow models

One of the biggest advantages of tidal: P90 ≈ P50

The amount of risks to be managed within a project finance deal is huge



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Power Purchase agreements reduce offtake risk

If Feed-in Tariffs are not available:

"A Power Purchase Agreement (PPA) [is] a supply contract for the long-term sale of all power generated by the plant to one or more wholesalers (offtakers) to mitigate the risk of selling energy output"

Usually prices are also defined in a PPA

- Fixed component (capacity charge) – mainly in order to cover fixed costs of the plant and ensure ROI for investors and debt service for debtors
- Variable component (energy charge, energy fee) – indexed to power produced. Originally meant to cover variable costs (fuels, O&M)
- In renewables: Variable component is dominant

PPAs are often structured on a take-or-pay basis

Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2013, p. 65

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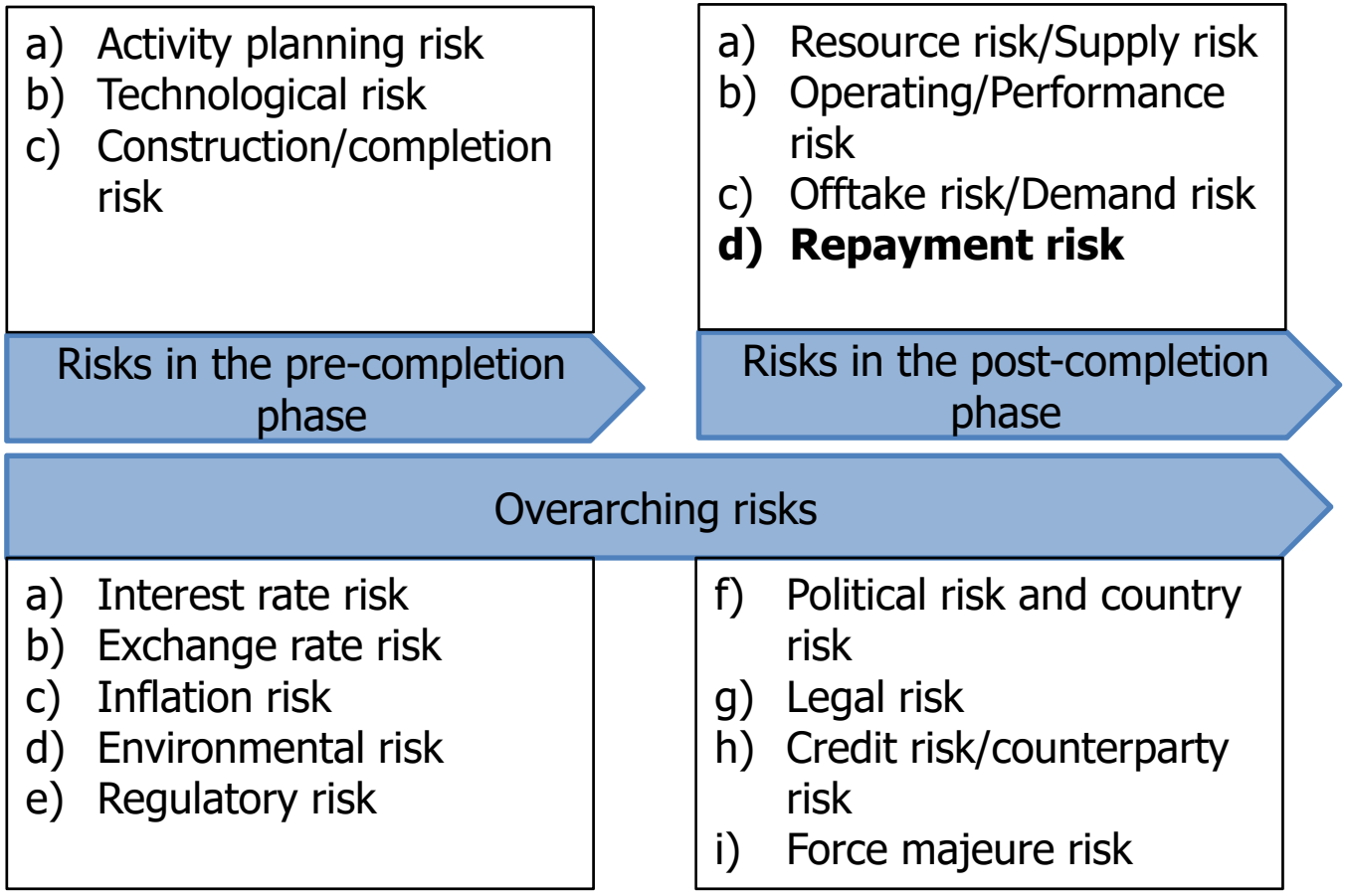

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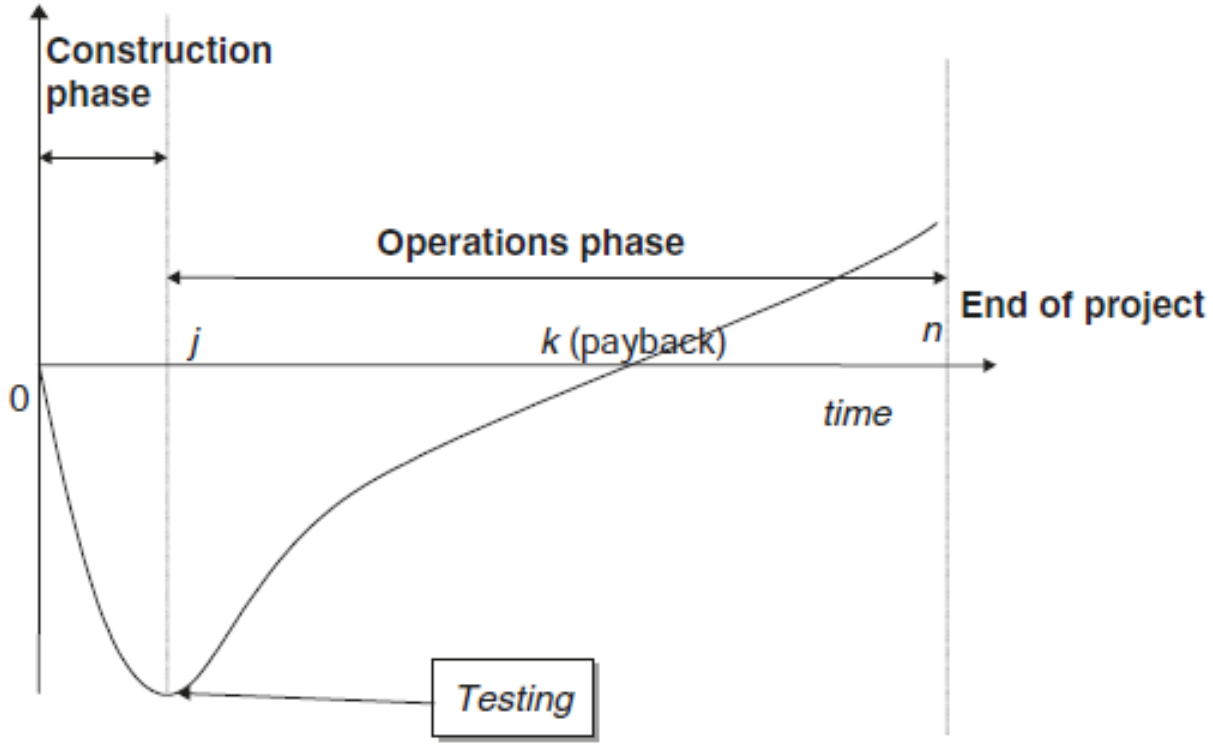
(Successful) projects display a characteristic pattern of cumulative project cash flows

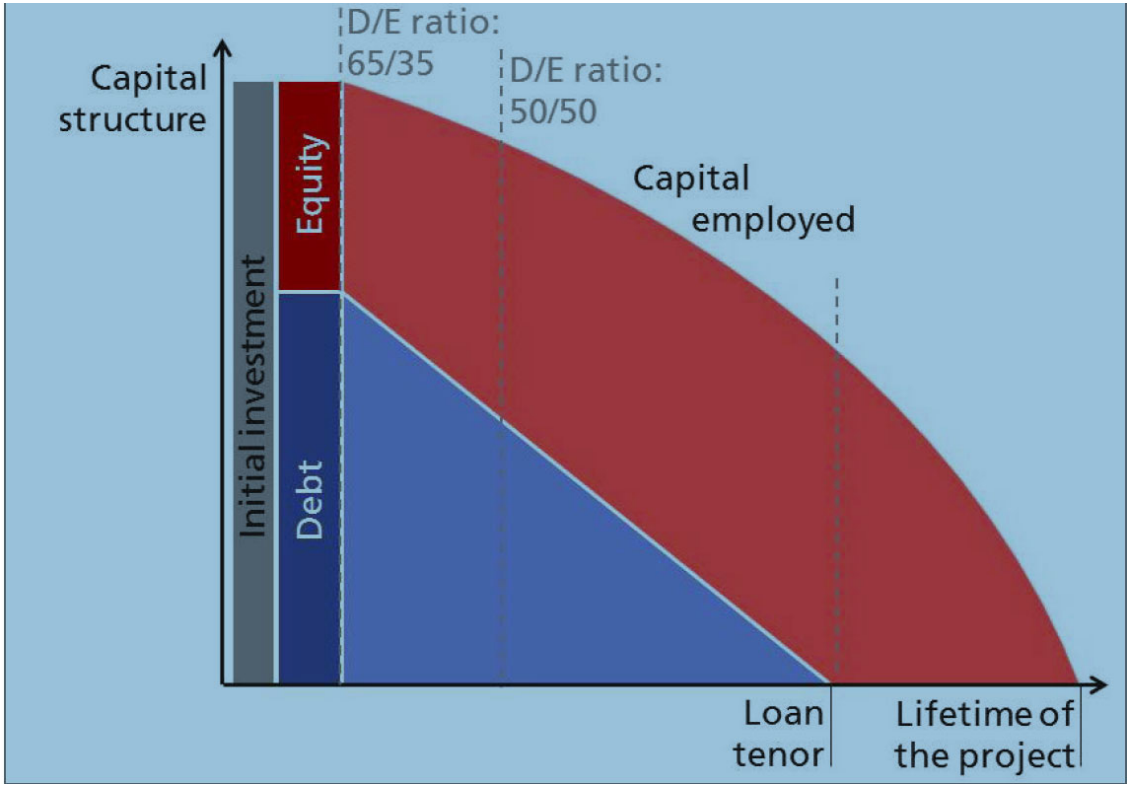


Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2008, p. 104

Several measures are taken to mitigate the repayment risk

1. **Loan tenors < Project life time**
2. Project cash flows have to fulfill certain quantitative criteria
3. Debt Service Reserve Account
4. Cash Sweeps
5. Clearly defined cash-flow waterfalls

Loan tenors are always chosen shorter than the project lifetime



Source: Frankfurt School, FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, „Certified Expert in Climate & Renewable Energy Finance", Module 7, p.40

Several measures are taken to mitigate the repayment risk

1. Loan tenors < Project life time
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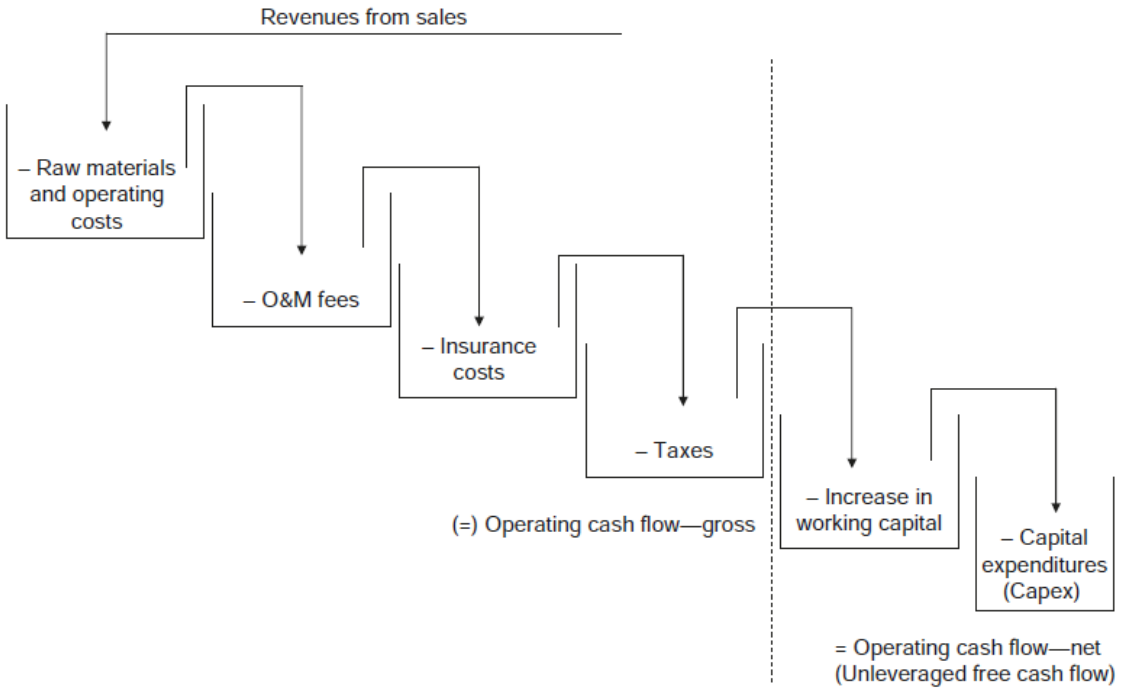
3. **Project cash flows have to fulfill certain quantitative performance criteria (ratios)**
4. Debt Service Reserve Account
5. Cash Sweeps

The Unleveraged Free Cash Flow is the cash flow available to all providers of capital

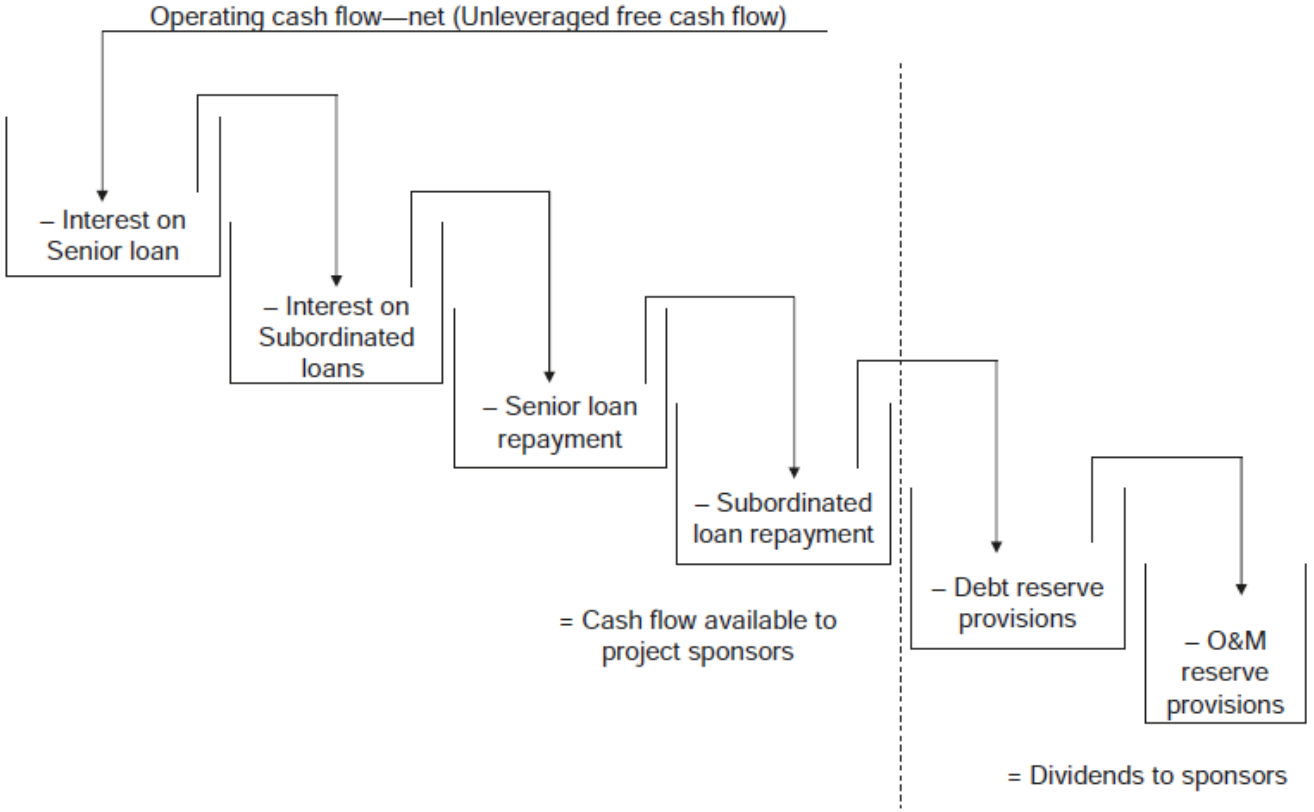
Calculation of UFCF along the following waterfall structure:



UFCF is sometimes also called CFADS (Cash Flow available for debt service)

Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2008, p. 103

Cash flow waterfall clearly describes the distribution of funds during ops phase



Source: S. Gatti,"Project Finance in theory and practice", Academic Press, 2008, p. 117

Translated into Finance vocabulary that means …

Required condition during complete PF deal:

Unleveraged Free Cash Flow(1) (UFCF) (+ Debt Service Reserves of period)

!

>

required Principal + Interest payments of period

Debt service

Central ratio "Debt Service Cover Ratio":

$$\text{DSCR} = \frac{\text{UFCF (+ Debt Service Reserves of period)}}{\text{Debt Service of period}}$$

(1) Sometimes also called Cash-Flow available for debt service (CFADS)

Some words on DCSRs (I)

1. $\mathrm{DSCR} \geq 1$, ensures that the project can deliver its debt service in the period of investigation
2. In the "worst case" the project has to deliver $\mathrm{DSCR} \geq 1$ for the project life time.
3. In the "base case", lenders require $\mathrm{DSCR} = 1{,}3$ (+/-)

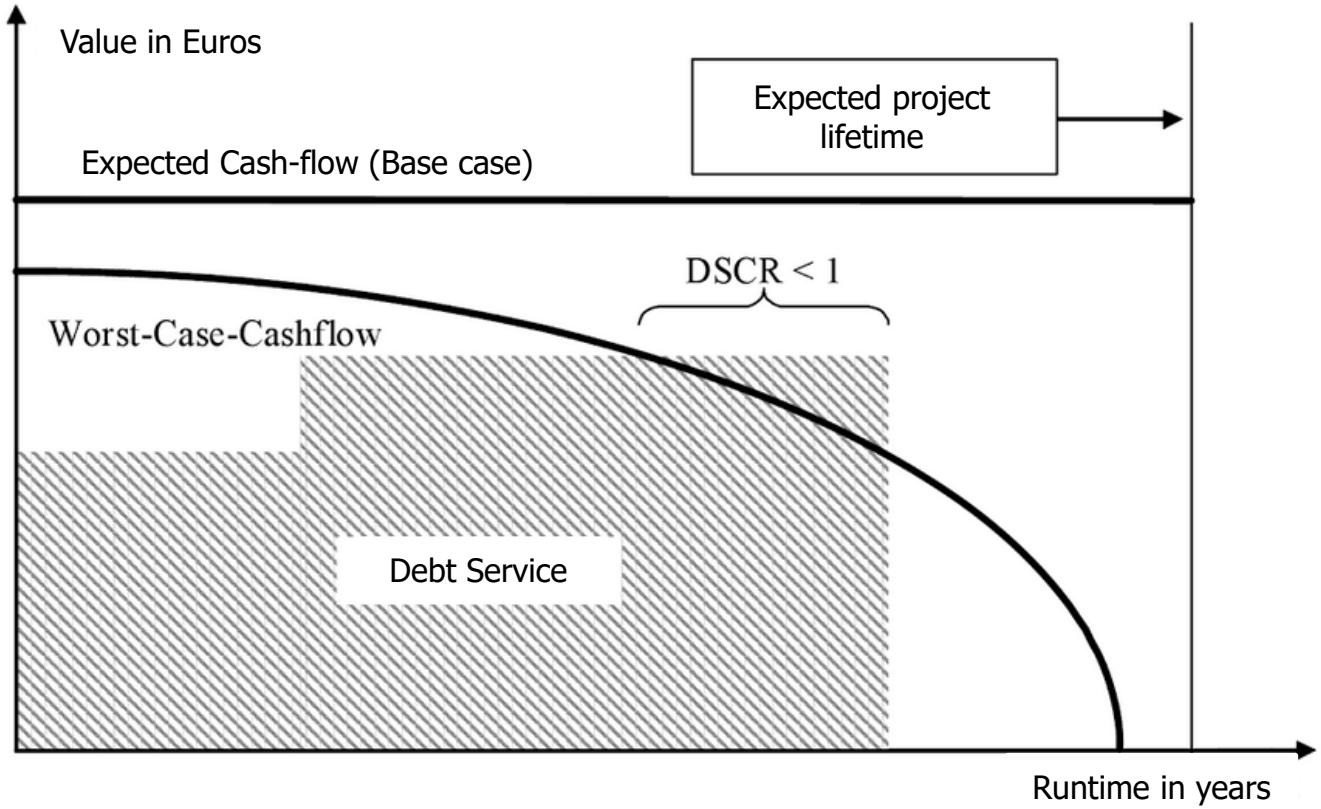
Additional figure calculated in project finance is the Average Debt Service Cover Ratio for a PF loan with a length of the amortization plan *n*

$$AVDSCR = \frac{\sum_{t=1}^{n} DSCR_t}{n}$$

Repayment structures influence DCSRs

1. Installment loan: Constant installment and declining interest payments lead to an increasing DSCR over time (if free cash-flows are constant)
2. Annuity loan: Constant debt service leads to constant DSCR over time (if free cash-flows are constant)
3. Sculptured Repayment: Individualized repayment structure with the aim to keep the DSCR at a certain level – keeps the repayment structure in line with project cash-flows
4. Repayment with residual value: Usually good DSCRs until last year
   ⇨ Insecurity about follow-up financing

Scenario analyses are usually made to understand the DCSR of a project better



Source: J. Böttcher, "Finanzierung von Erneuerbare-Energien-Vorhaben", Oldenbourg 2009, p.122
Translated by me

Loan Life Cover Ratio compares value of the project cash flows with outstanding debt

$$\text{Loan Life Cover Ratio } LLCR = \frac{PV(UFCF) + Debt\ service\ reserves}{PV(Outstanding\ debt\ service)}$$

Important: LLCR is calculated until **maturity date of loan**

Project Life Cover Ratio compares value of the project cash flows with outstanding debt

$$\text{Project Life Cover Ratio } PLCR = \frac{PV(UFCF) + \ Debt\ service\ reserves}{PV(Outstanding\ debt\ service)}$$

Important: PLCR is calculated until **end of project**

Which relationship applies: PLCR $\lessgtr$ LLCR ?

Several measures are taken to mitigate the repayment risk

1. Loan tenors < Project life time
2. Clearly defined cash-flow waterfalls
3. Project cash flows have to fulfill certain quantitative performance criteria (ratios)
4. **Debt Service Reserve Account**
5. Cash Sweeps

Debt Service Reserve Account is especially helpful at fluctuating cash flows

(Normal) Specifics

- Pre-agreed amount (usually 3-12 months debt service) to be paid into a special account as cash reserve
- Money belongs to SPV – hence SPV receives interests
- No dividends may be paid during DSRA is paid in
- Intention to use cash for unexpected cash needs
- After withdrawals have been made – account needs to be filled up to pre-agreed value
- After loan is paid back, DSRA is dissolved and remaining amount may be distributed as dividends
- DSRA reduces IRR for project sponsors!

Several measures are taken to mitigate the repayment risk

1. Loan tenors < Project life time
2. Clearly defined cash-flow waterfalls
3. Project cash flows have to fulfill certain quantitative performance criteria (ratios)
4. Debt Service Reserve Account
5. **Cash Sweeps**

The mechanism of a cash sweep is a covenant in the loan contract

"A cash sweep is the mandatory use of cash flow remaining after debt service and creation of the DSRA to pay down outstanding debt rather than distribute dividends to shareholders"

- Accelerated down-payment of debt
- Impact on project sponsors' IRR
- Due to reduced interest payments cumulative dividends until end of project will be higher if cash sweep is present, however, money flows for equity providers later (time value of money!)

Source: Frankfurt School, FS-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, „Certified Expert in Climate & Renewable Energy Finance", Module 7, p.45

Thank you for your attention

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