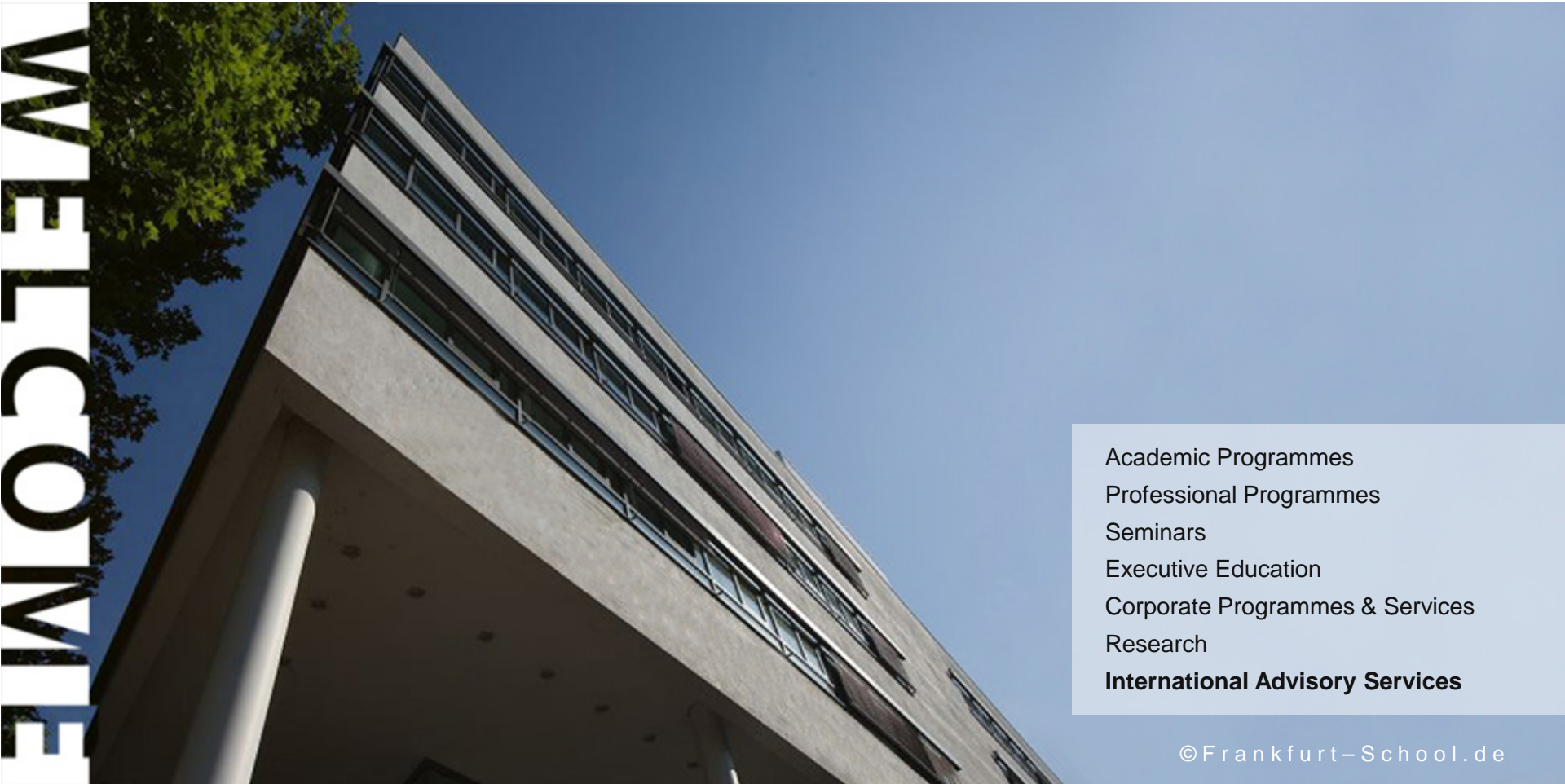


# IPM12: “Renewable Energy and Energy Efficiency – Ways out of the economic crisis!”

## Access to capital: The business case

Graham CHESHIRE



Academic Programmes  
Professional Programmes  
Seminars  
Executive Education  
Corporate Programmes & Services  
Research  
**International Advisory Services**

## Agenda

1. **Frankfurt School of Finance & Management**
2. Profitability: Wind, Geo-thermal, Solar, Bio-gas and Hydro-electric
3. Energy efficiency projects
4. Conclusions: Financing availability for Sustainable Energy: Debt and Equity

## Frankfurt School of Finance & Management

**Our products and services focus on the needs and requirements of the financial sector.**

- University – bachelor-, master-, and PhD programmes
- Education – professional education courses for bankers which may be pursued in parallel with full-time employment
- Research – emphasizes on financial economics, practical quantitative finance, management, international health management, and **development/climate finance**
- **Consulting – International Advisory Services for development finance**

## International Advisory Services

**We aim at contributing to the development of financial markets globally, as to make them more stable and inclusive at the same time.**

- **Our target group:** All stakeholders in the financial sector in developing and transition countries as well as emerging markets
- **Our goal:** Establishment of high-performance banking and financial sectors

### **Our competence centres:**

Micro-banking

Fund Management

SME Finance

Rural Finance

**Sustainable Energy Finance**

Risk Management

Housing Finance

# Sustainable Energy Finance Competence Centre

## Services of our Sustainable Energy Finance Competence Centre

- Assisting financial institutions in building up a successful business segment to finance energy efficiency (EE) and renewable energy (RE) investments
  - EE/RE lending and marketing strategy
  - Loan product development for different business segments (Retail, Micro, SME, Corporate), including standardisation of the respective EE/RE investments
  - EE/RE finance training courses and on-site coaching for financial institutions and investors (financial and technical aspects)
  - Loan portfolio screening (and clustering) to come across clients with high potential for EE/RE investment measures
  - Energy/CO<sub>2</sub> savings calculations
- Feasibility studies – market potential for sustainable energy finance
- Sustainable Energy Finance Summer Academy





## UNEP/FS Collaborating Centre

### **We have a strategic partnership with UNEP: Collaborating Centre for Climate and Sustainable Energy Finance**

- Climate Finance Innovation Facility, Asia
- Seed Capital Assistance Facility, Africa
- End-user Finance for Access to Clean Energy Technologies, Southeast Asia
- National Climate Finance Institutions Support Programme, worldwide
- Microfinance for Ecosystem-based Adaptation to Climate Change, Latin America
- Global Trends Report
- Sustainable Energy Finance Summer Academy
- Research and education

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3. Energy Efficiency Projects
4. Conclusions: Financing availability for Sustainable Energy: Debt and Equity

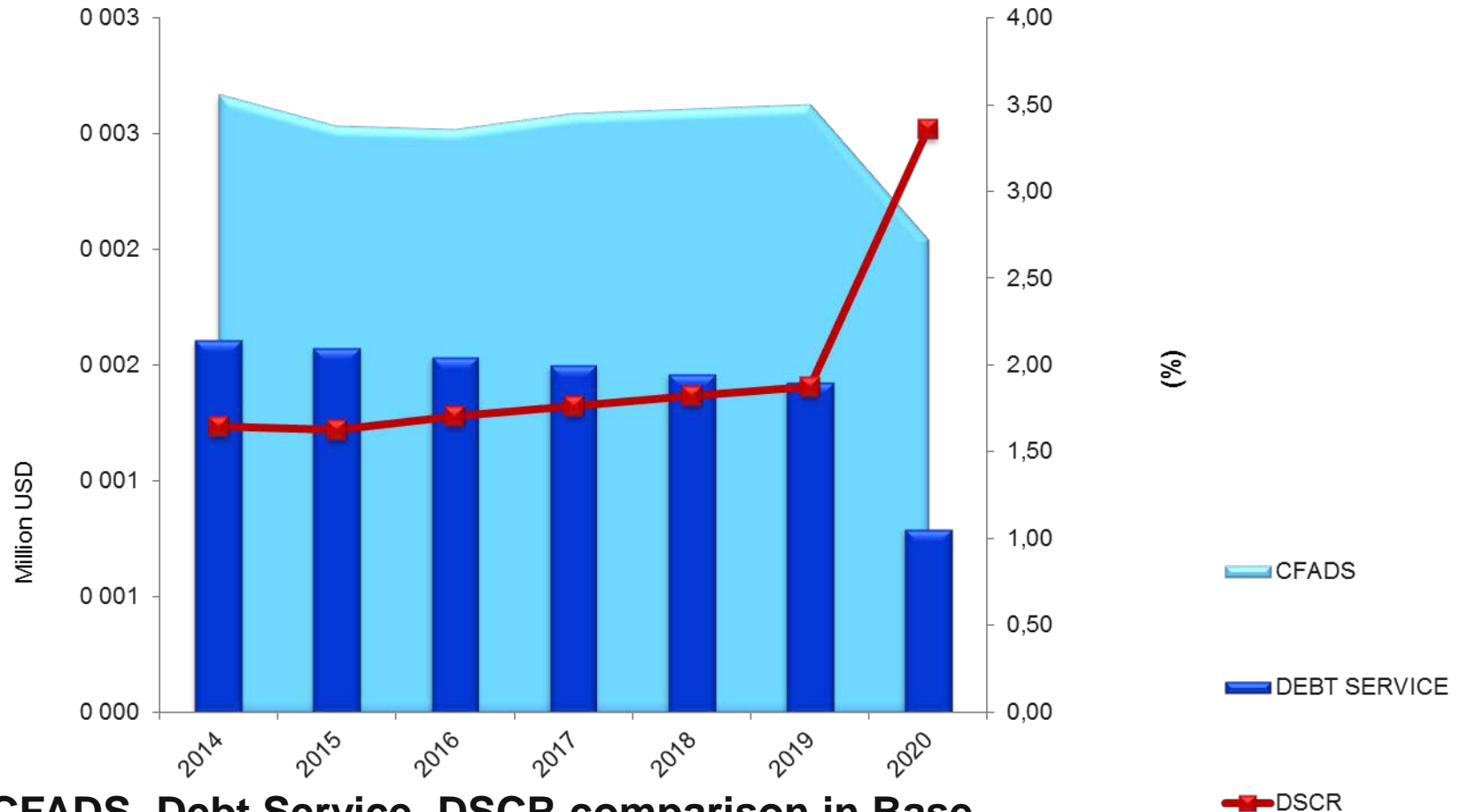
## Profitability of **Wind Power** Projects: Investor perspective

		Base Case	Low Production	High Production	Feed-in Tariff
Electricity Production (kWh / Year)		36,000,000	31,900,000	40,400,000	36,000,000
Exc. Cost of Debt	NPV	9,514,538	6,885,402	13,360,339	141,111
	IRR %	13.3	11.6	15.5	7.1
	SPB (Years)	5.9	6.6	5.1	9.2
Inc. Cost of Debt	NPV	8,801,135	6,171,998	12,646,936	(572,293)
	IRR %	<b>12.7</b>	11.1	14.9	6.6
	SPB (Years)	6.2	7.0	5.4	9.7

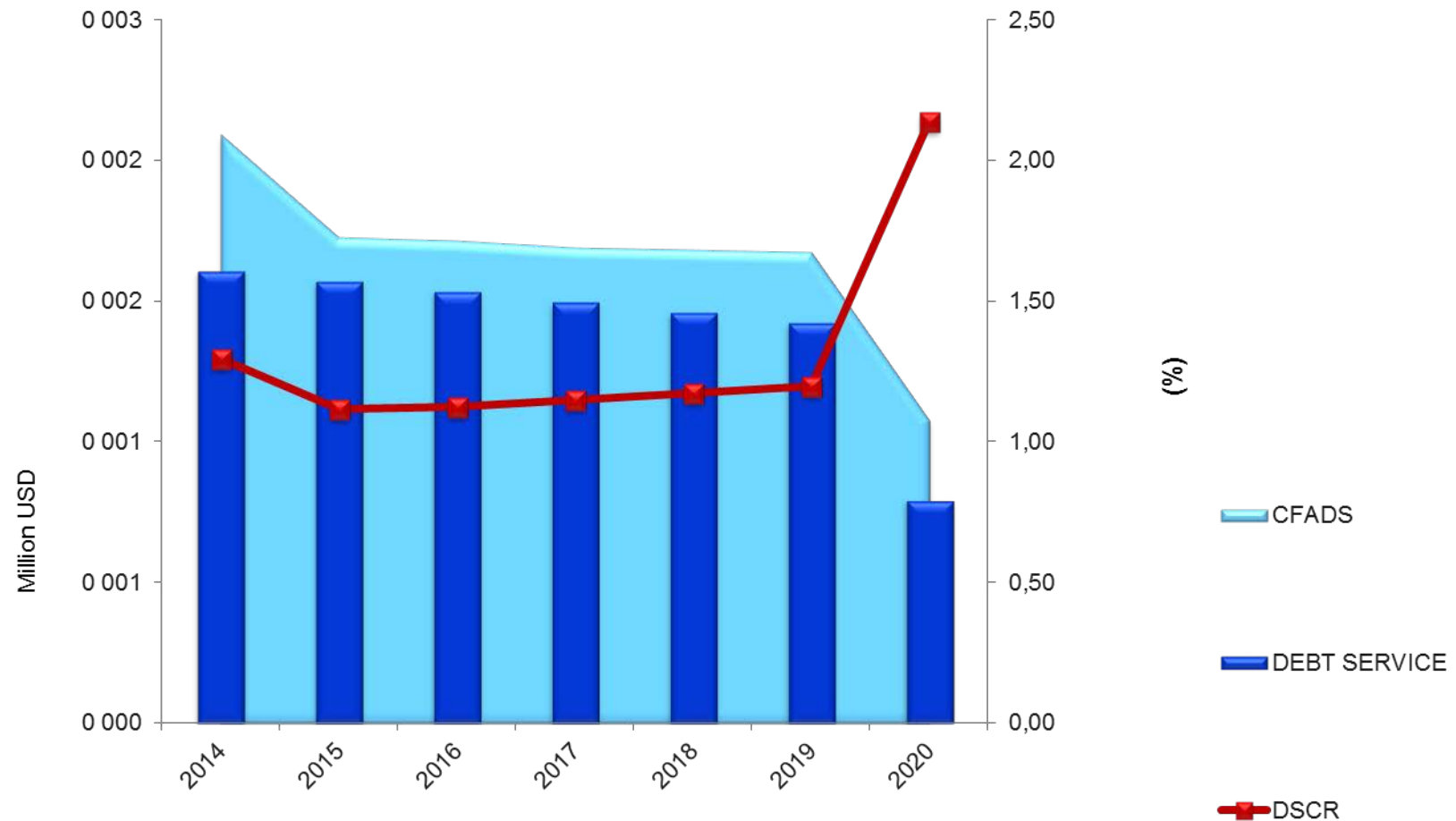
Project Investment EUR 18mio. ....Debt:Equity 85:15



## Risk of **Wind Power** Projects: Bank perspective



**CFADS, Debt Service, DSCR comparison in Base Case scenario using forecast market electricity prices**



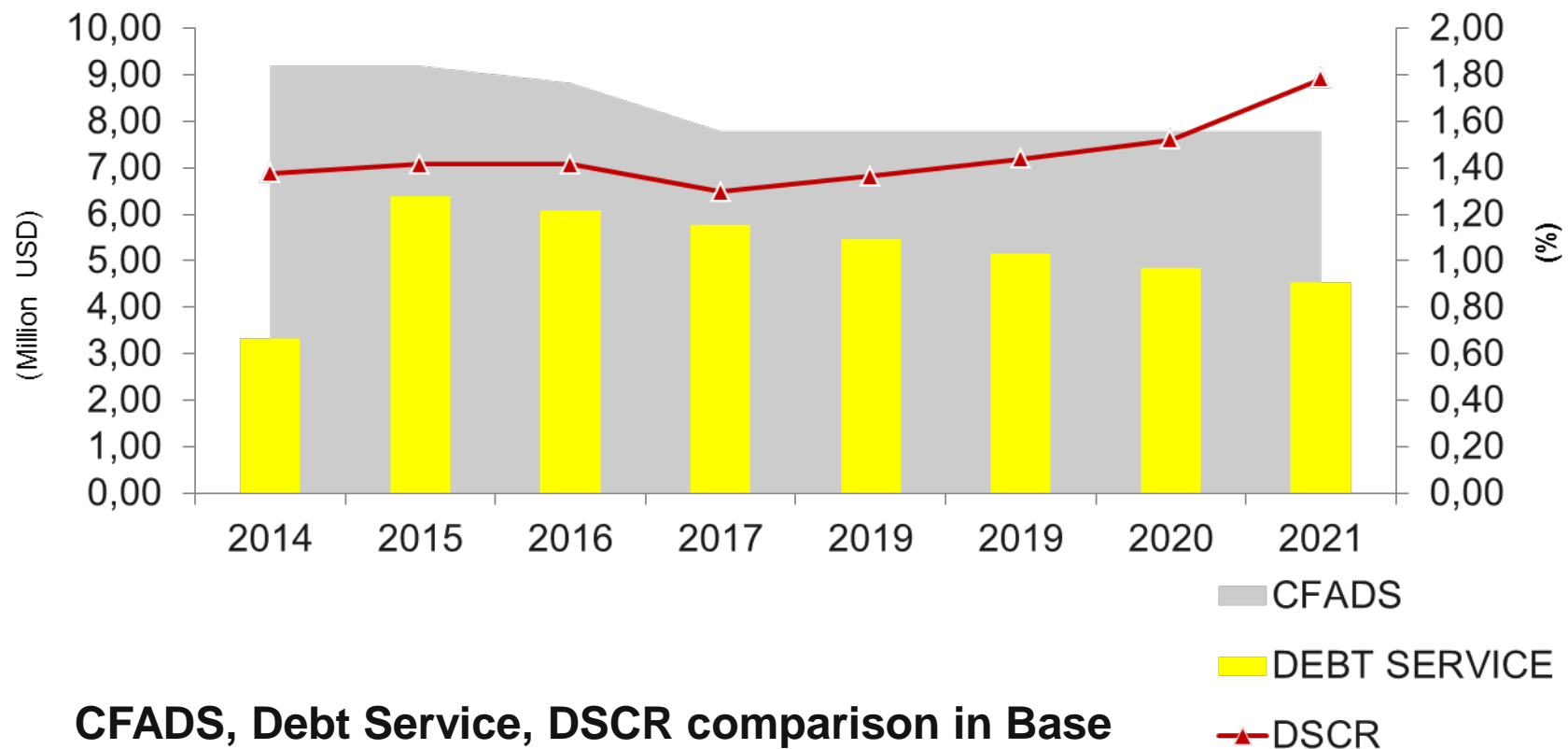
**CFADS, Debt Service, DSCR comparison using guaranteed Feed-in-Tariff Prices**

## Profitability of **Geothermal** Power Projects: Investor perspective

		Base Case
Without Cost Of Financing	NPV 7%	22,341,019
	IRR %	13.0
	Simple Payback	6.5
With Cost Of Financing		Base Case
	NPV 7%	12,798,717
	IRR %	<b>10.2</b>
	Simple Payback	8.4

Project Investment EUR 50mio. ....Debt:Equity 70:30

## Risk of **Geothermal** Power Projects: Bank perspective



**CFADS, Debt Service, DSCR comparison in Base Case scenario using forecast market electricity prices**

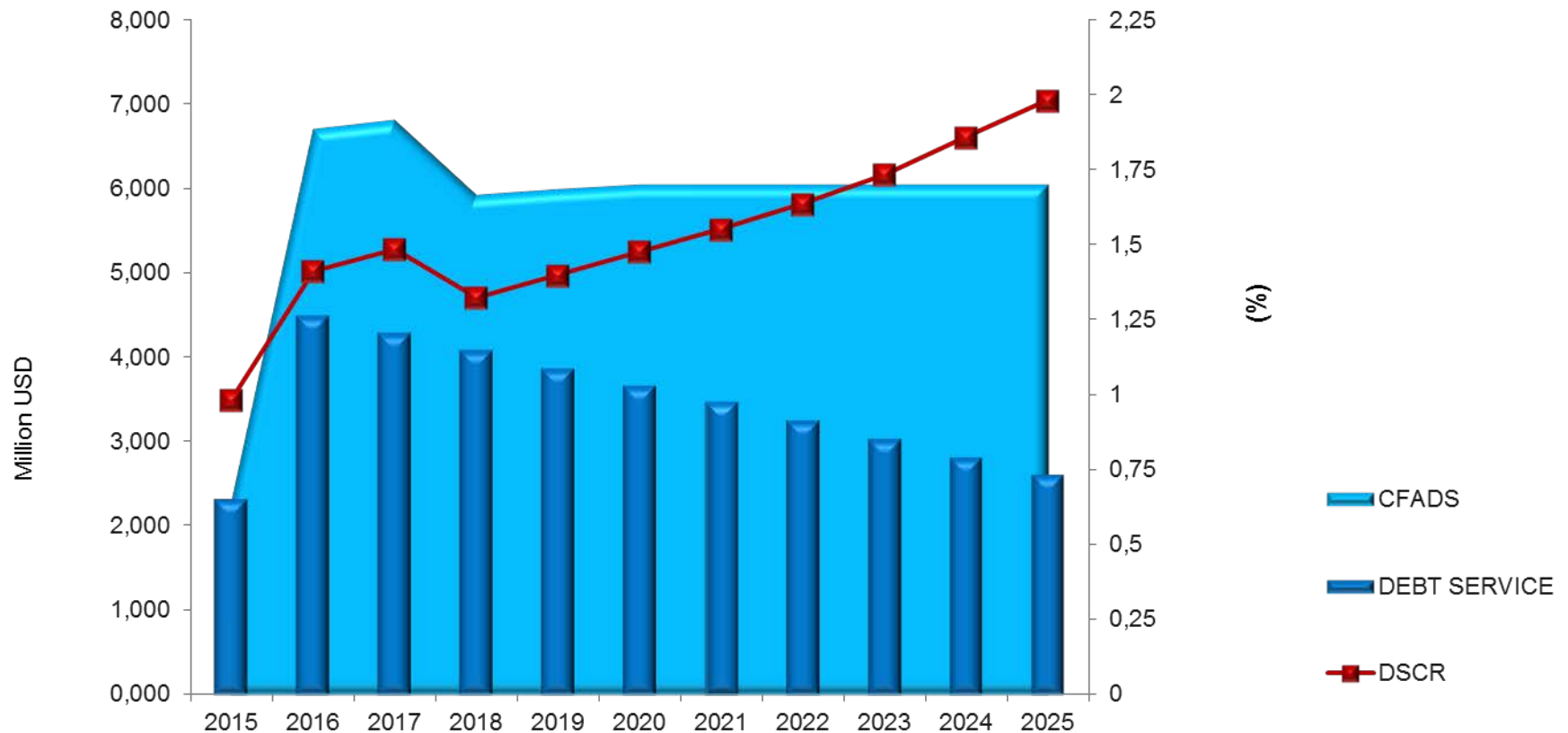
## Profitability of **Hydro-Electric** Power Projects: Investor perspective

		Base Case	High Production	Low Production	Low Price
Without Cost Of Financing	NPV %7	13,727,369	19,004,204	8,356,777	-3,465,454
	IRR %	11.37%	12.87%	9.75%	5.74%
	Simple Payback	9.49	8.62	10.61	14.51
With Cost Of Financing		Base Case	High Production	Low Production	Low Price
	NPV %7	3,037,500	8,323,918	-2,342,622	-14,179,459
	IRR %	<b>7.86%</b>	9.30%	6.31%	2.40%
	Simple Payback	12.00	10.86	13.48	18.72
Electricity Production		56,600 MWh/y	63,000 MWh/y	50,100 MWh/y	56,600 MWh/y

**Project Investment USD 43mio (EUR 34mio).**

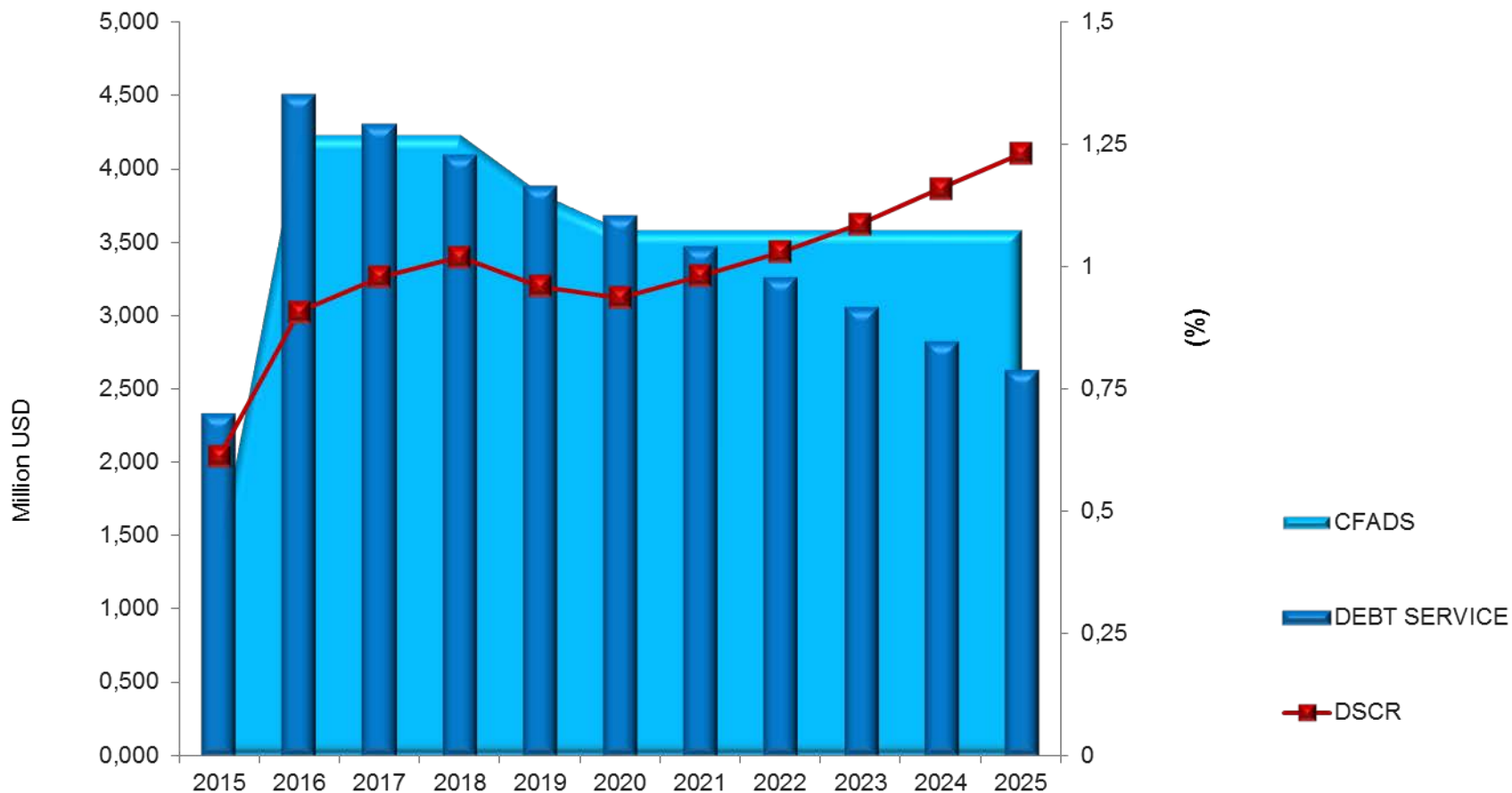
**.....Debt:Equity 60:40**

## Risk of **Hydro-Electric** Power Projects: Bank perspective



**CFADS, Debt Service, DSCR comparison in Base Case scenario using forecast market electricity prices**





## CFADS, Debt Service, DSCR comparison using guaranteed Feed-in-Tariff Prices

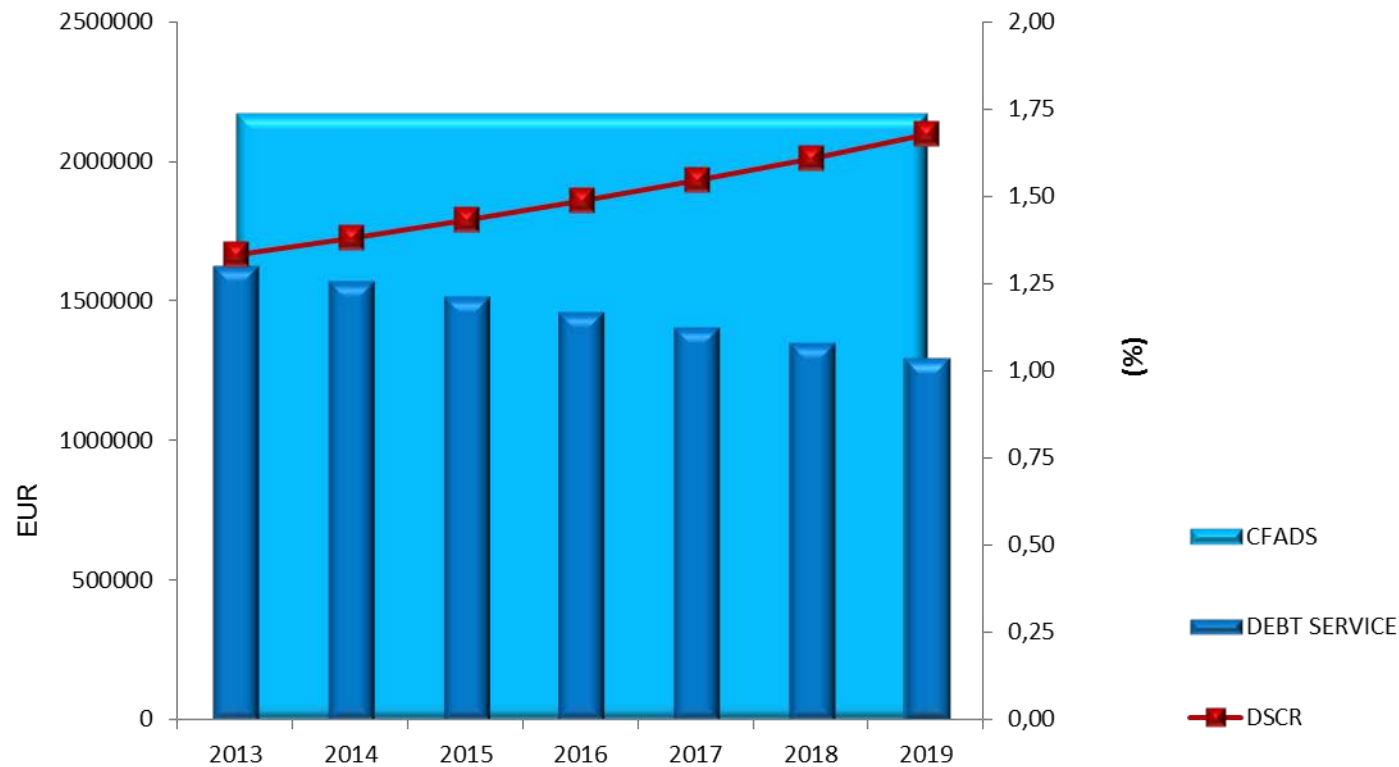
## Profitability of **Bio-Gas** Power Projects: Investor perspective

With Cost Of Financing		Base Case
	NPV %7	EU 1.3 mio
	IRR %	<b>14.9%</b>
	Simple Payback	7.6 years

Electricity Output	19.004 MWh
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Project Investment EUR 11 mio.....Debt:Equity 62:38

## Risk of **Bio-gas** Power Projects: Bank perspective



**CFADS, Debt Service, DSCR comparison using guaranteed Feed-in-Tariff Prices and current Green certificate price**

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## Energy Efficiency Projects

- Financial analysis is based on the advantage gained by the additional investment.
- e.g. Computer controlled LED lighting systems instead of traditional lighting .... What is the NPV and IRR profitability gain?
- E.g. Underground perishable food storage instead of above ground cooling systems ...
- Each project needs to be treated on its merits and energy engineers must be very creative thinkers.....

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## Banks and the financial crisis

- Commercial bankers require more equity to mitigate default risk and to make renewable energy projects more bankable in the wake of the financial crisis.
- This higher equity requirement is more necessary also in the light of the upcoming BASEL III capital increases in support of lending.
- Commercial banks are less motivated to use their capital for long maturity loans which reduce their fee earning capacity (higher capital investment turnover = higher fee generation)

*Currently there is evidence of a shift from bank debt financing to (quasi) Equity financing for RE projects*

## Equity Investors and the financial crisis

- Seek the best risk/return relationship in similar sectors.
- Since the financial crisis investors and equity funds have less room for manoeuvre.
- They seek « safe investments » with more modest returns than in previous times; often preferring to refinance existing investments to green-field projects (construction risk).
- Start-up equity is difficult to find or prohibitively expensive for RE and EE projects.
- Equity funds often seek access to the same collateral as banks.
- Often large conglomerates invest their equity in their own RE and EE projects, but small specialty promoters have difficulties in obtaining equity.

## How can the Tax-payer and Politicians help to promote EE and RE investment?

- Mitigate the shortage of available collateral by
  - Lowering Debt to Equity requirements of public banks thus taking more risk.
  - Providing Debt and Quasi-Equity guarantee instruments.
  - Continue to give preference to, and to encourage, Renewable Energy power resources over fossil fuel resources by prioritising RE offtake (with financial rewards). Thus ensuring the cash flow of RE projects for debt servicing and equity investor reward.



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