

Private Equity & Venture Capital in the renewable energy sector: market drivers and investors' perspective.



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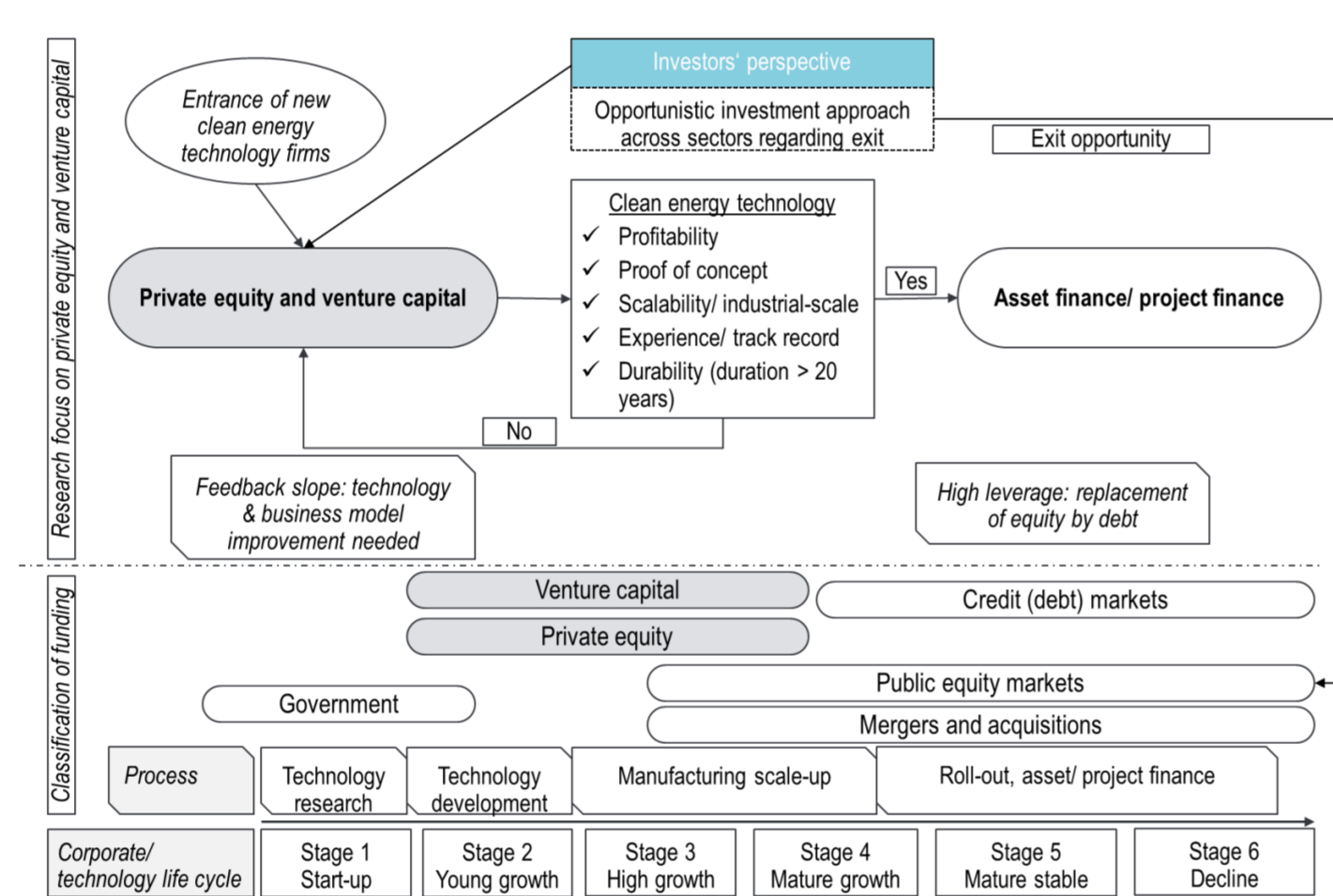
Introduction

Looking across sectors, **Private Equity (PE)** and **Venture Capital (VC)** have been receiving high attention in recent years with the strongest five-year PE deal number and value increase in history hovering at 3,000 and USD 600 bn respectively. At the same time, the transition within the energy sectors towards **renewable energy (RE)** supply has been significantly evolved, reaching 33 % within the global electricity mix. Since little research has been conducted on PE & VC in the RE sector, this paper aims at determining how PE & VC have been deployed in the RE sector within the last decade.

Methodology, sample and concept

This paper considers the deployment of the PE & VC financial instruments with regard to the technological development within the RE sector based on a **literature review**. Beside other studies, the basis of the literature review are the annual reports on *Global Trends in Renewable Energy Investment provided by Bloomberg New Energy Finance (BNEF)* of the United Nations (UN) programme.

Figure 1.: classification of PE & VC and research approach



In addition, the investors' perspective with an **opportunistic exit approach** across the biotechnology and information and communication technology (ICT) sectors from a global perspective based on **pricing regression models** with recent data from Capital IQ is analyzed.

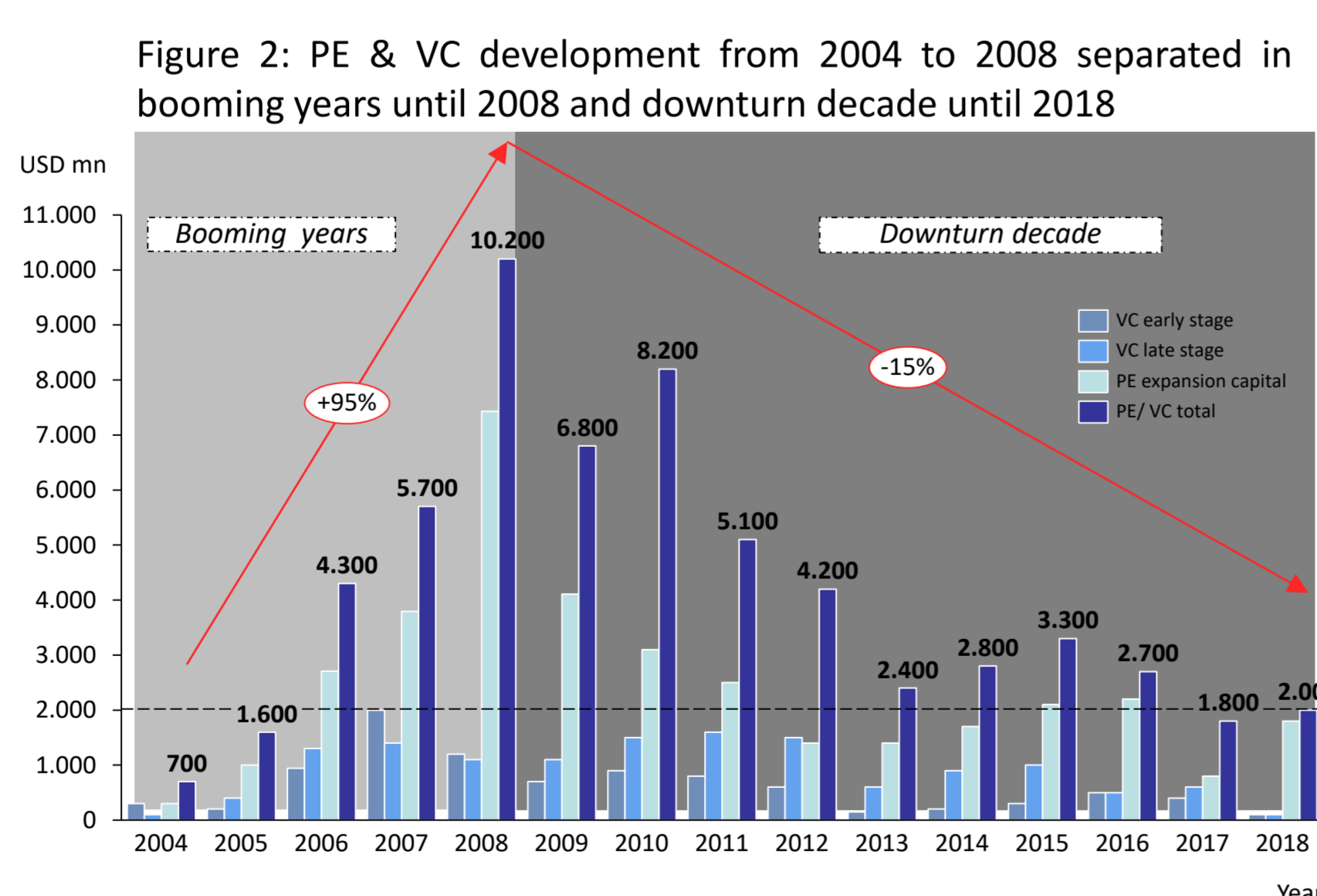
Following hypotheses are derived:

- H_1 : PE & VC in the RE sectors are increasing on highly liquid markets and pressure towards sustainability investments.
- H_2 : The RE market is financially attractive for the opportunistic investor.

Global development of PE & VC within the renewable energy sector

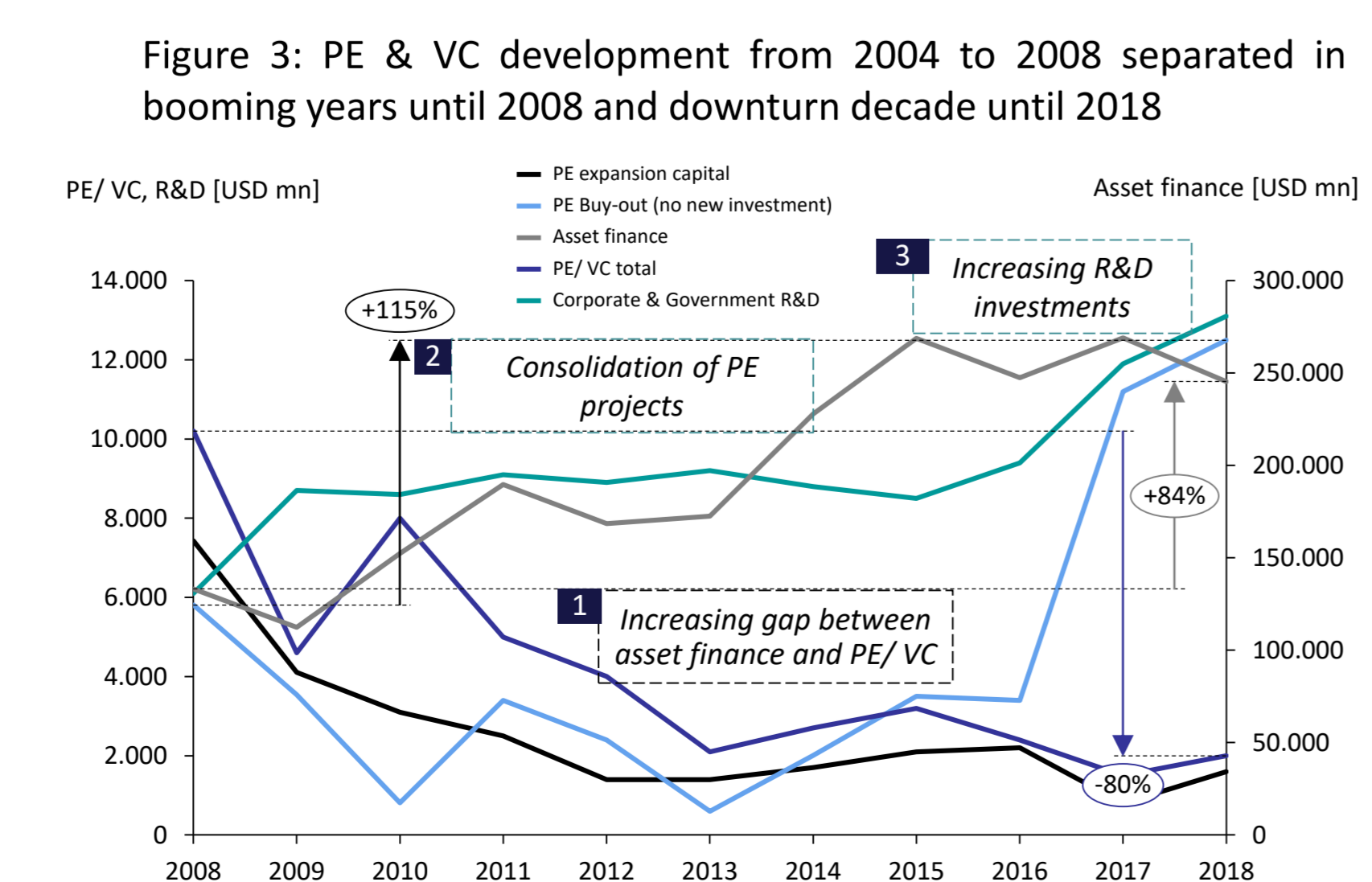
Development of PE & VC from 2004 to 2018 can be split into two parts:

- Booming years: from 2004 to 2008 with a CAGR of +95 % reaching USD 10.2 bn
- Downturn decade: from 2009 to 2018 with a CAGR of -15 % falling to USD 2 bn in 2018.



Looking at PE/VC from and other finance sources in the downturn decade:

- Spreading curves of PE/VC new investments (down -80 %) and asset finance (up +84%)
- Consolidating PE projects with buy-outs increased by 115 %
- Increasing R&D within established companies



Main drivers

Beside the main parameters listed in table 1, with **technology maturity** and **grid parity** due to **falling leveled cost of electricity (LCOE)**, a **business model shift** in new RE ventures from technology production to technology service innovation is discovered.

Figure 4: PE & VC total and R&D vs. LCOE

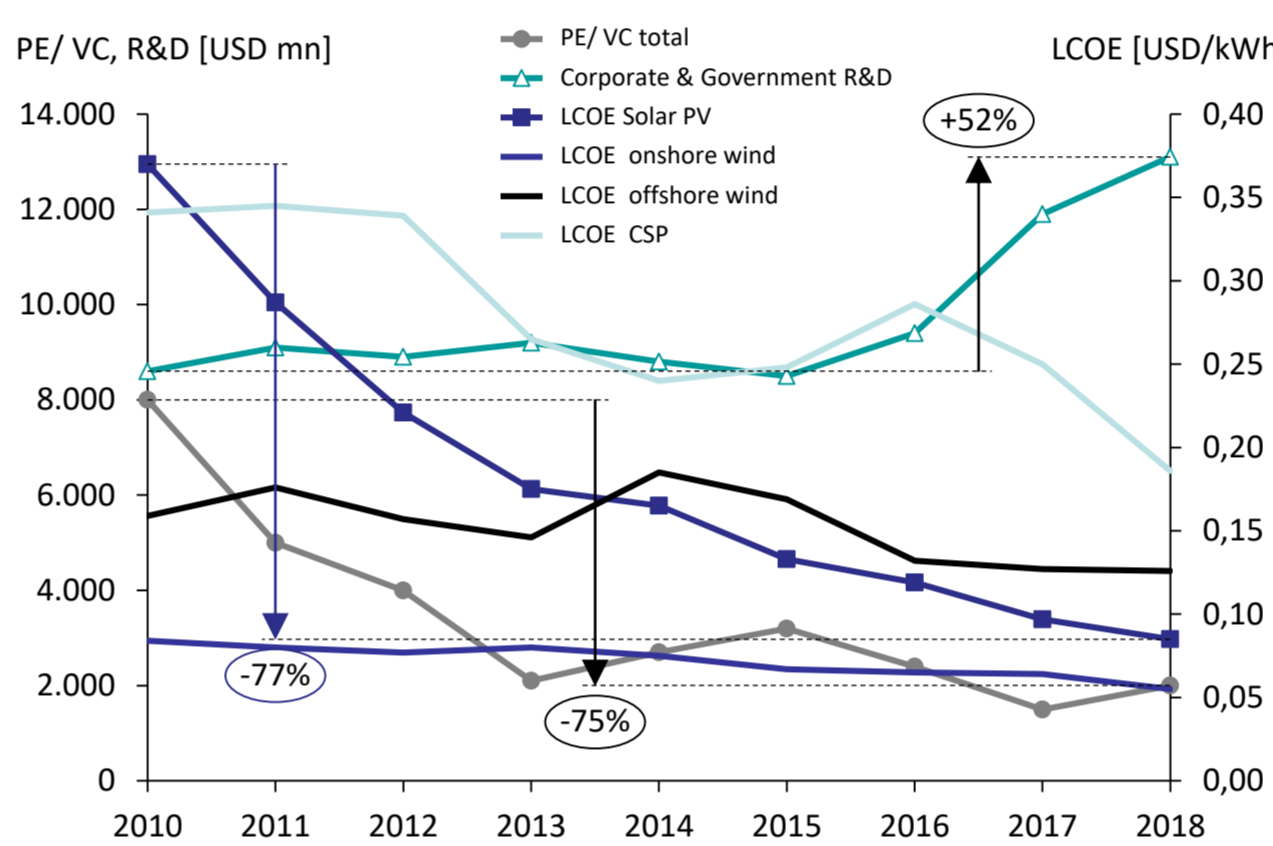


Figure 5: Asset finance vs. LCOE

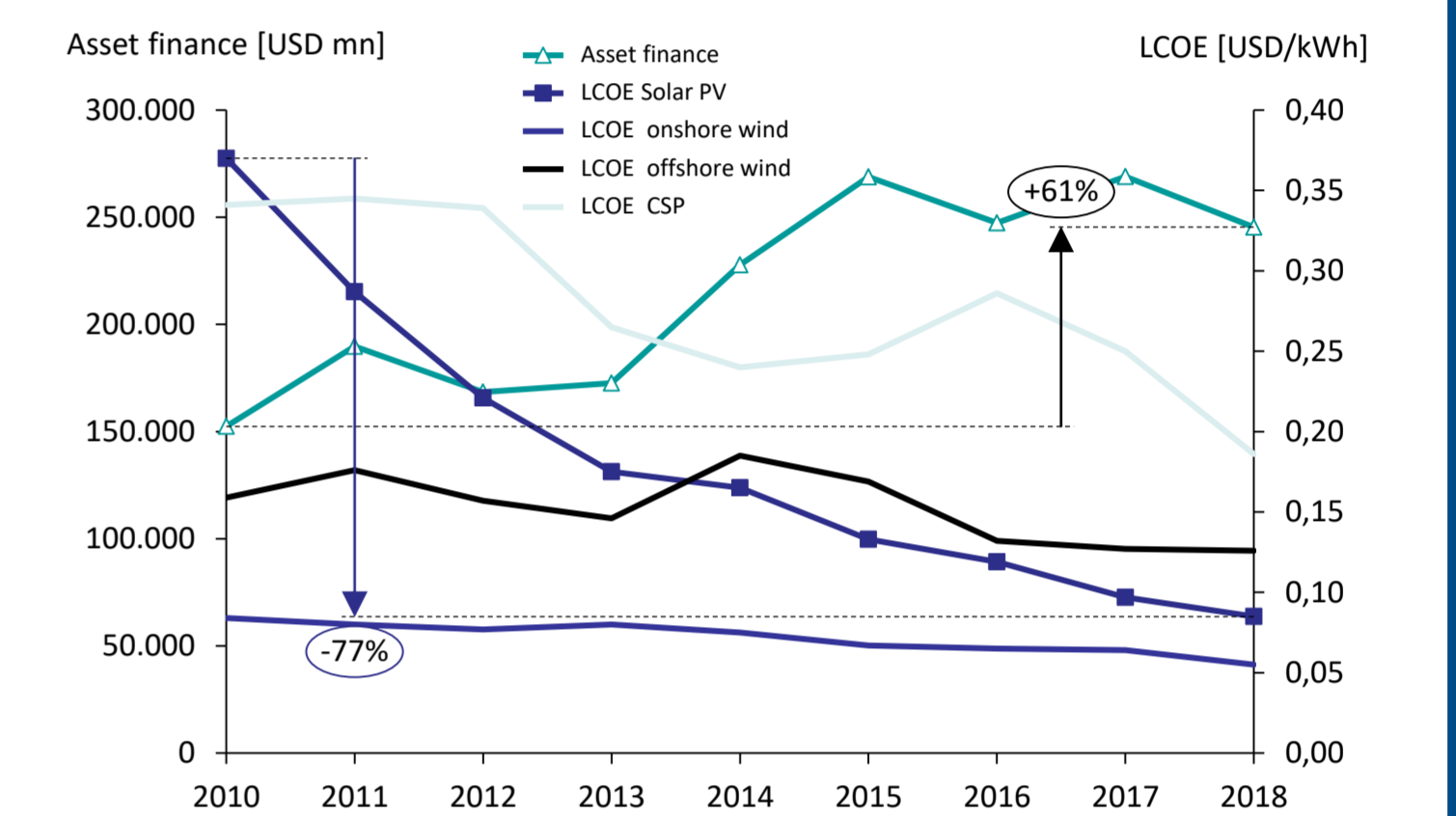


Table 1: Main drivers of PE/VC investment increase and decrease

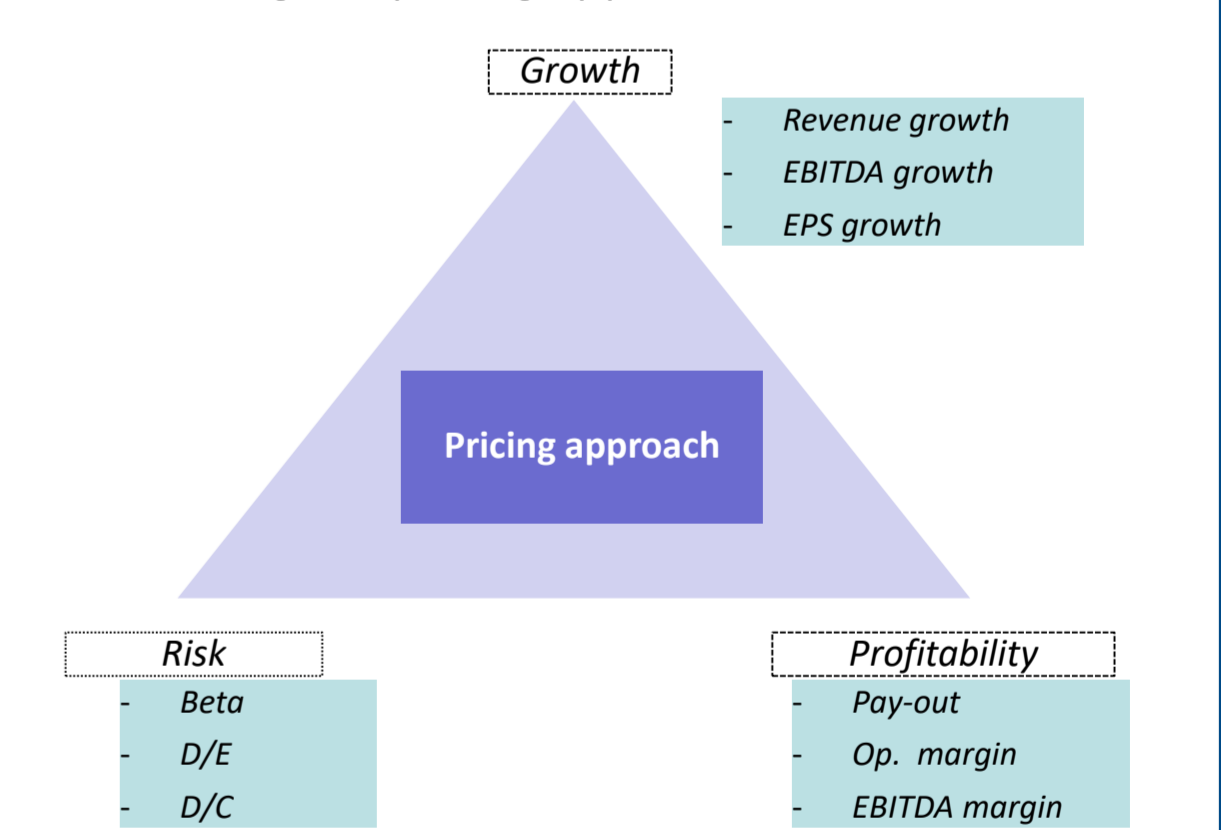
Sphere	Parameter Criterion	Impact on new PE/VC investment	
		Increase	Decrease
Politics	Targets	Yes	No
Politics	Incentive (push/pull)	Yes	No
Technology	Development status	Immature/ new/ growth	Mature/ known/ stable
Technology	LCOE	High	Low
Capital/ financial market	Debt availability	Low	High
Capital/ financial market	Public market pricing (exit through IPO)	High	Low
Energy macroeconomic	Fossil fuel prices	High	Low
Energy macroeconomic	Fossil fuel supply	Low	High

Opportunistic investor: pricing across sectors

To approach the opportunistic investor perspective regarding **PE & VC exit opportunities**, regression models based on the **key pricing drivers** and **pricing multiples** across sectors and regions have been run.

- The key pricing driver of every firm encompasses: growth, risk and profitability
- Poxy for each pricing driver is implemented
- The pricing multiples encompass: P/BV, TEV/ EBITDA and P/E
- Region- and sector-based comparison

Figure 6.: Drivers of the opportunistic investor deriving the pricing approach



$$Pricing\ Multiple_i = \beta_0 + \beta_1(\text{expected growth}) + \beta_2(\text{risk}) + \beta_3(\text{profitability}) + \epsilon_i$$

Table 2: Pricing results across sectors and regions

Region	Renewable Energy			Information & Communication Technology			Biotechnology			ΔPricing ICT			ΔPricing Biotechnology		
	Median	Mean	Regression	Median	Mean	Regression	Median	Mean	Regression	Median	Mean	Regression	Median	Mean	Regression
Europe	9.81	14.22	11.95	12.30	19.25	15.76	18.20	34.12	24.13	25.38%	35.40%	31.94%	85.52%	140.03%	102.02%
US & Canada	12.35	15.03	14.85	13.70	22.57	20.14	12.25	22.92	26.06	10.93%	50.17%	35.65%	-0.81%	52.49%	75.49%
Asia & Pacific developed markets	8.68	10.84	9.64	8.56	16.08	12.33	14.65	26.38	15.84	-1.38%	-48.32%	27.93%	68.88%	143.34%	64.33%
Asia & Pacific emerging markets	9.15	15.00	13.49	13.90	27.24	19.63	20.75	32.51	33.95	-51.81%	-74.59%	-45.57%	126.78%	108.38%	151.71%
Africa & Middle East	10.80	21.08	9.83	9.02	14.22	10.29	5.47	13.06	N/A	-14.14%	-32.55%	7.99%	-47.82%	-38.03%	N/A
Latin America & Caribbean	8.77	11.15	10.30	10.20	16.20	13.85	16.80	62.07	N/A	16.31%	-45.26%	34.42%	114.37%	456.41%	N/A

Conclusion

Based on the literature review and the pricing regression models, H_1 and H_2 are declined. Maturity of RE technology and falling LCOE enable asset finance with high debt. Further technology innovation involve high risk profile of individual PE & VC investors, which is rather R&D financed. Additionally, PE experienced high consolidation pressure. Business model innovation with a focus on technology service attracts PE & VC, though with less capital requirements. Assuming an opportunistic investor who aims at high exit pricing, the RE sector seems significantly less attractive than the biotechnology and ICT sector, contributing to the aridification of new PE & VC investments in the RE sector.