

FiT for Life

The importance of establishing a stable investment climate for PV

Mark Fulton

Global Head of Climate Change Investment Research
DB Climate Change Advisors

January 26, 2010

<http://www.dbcca.com/research>

<http://www.dbcca.com>



DB Climate Change Advisors

Deutsche Bank Group

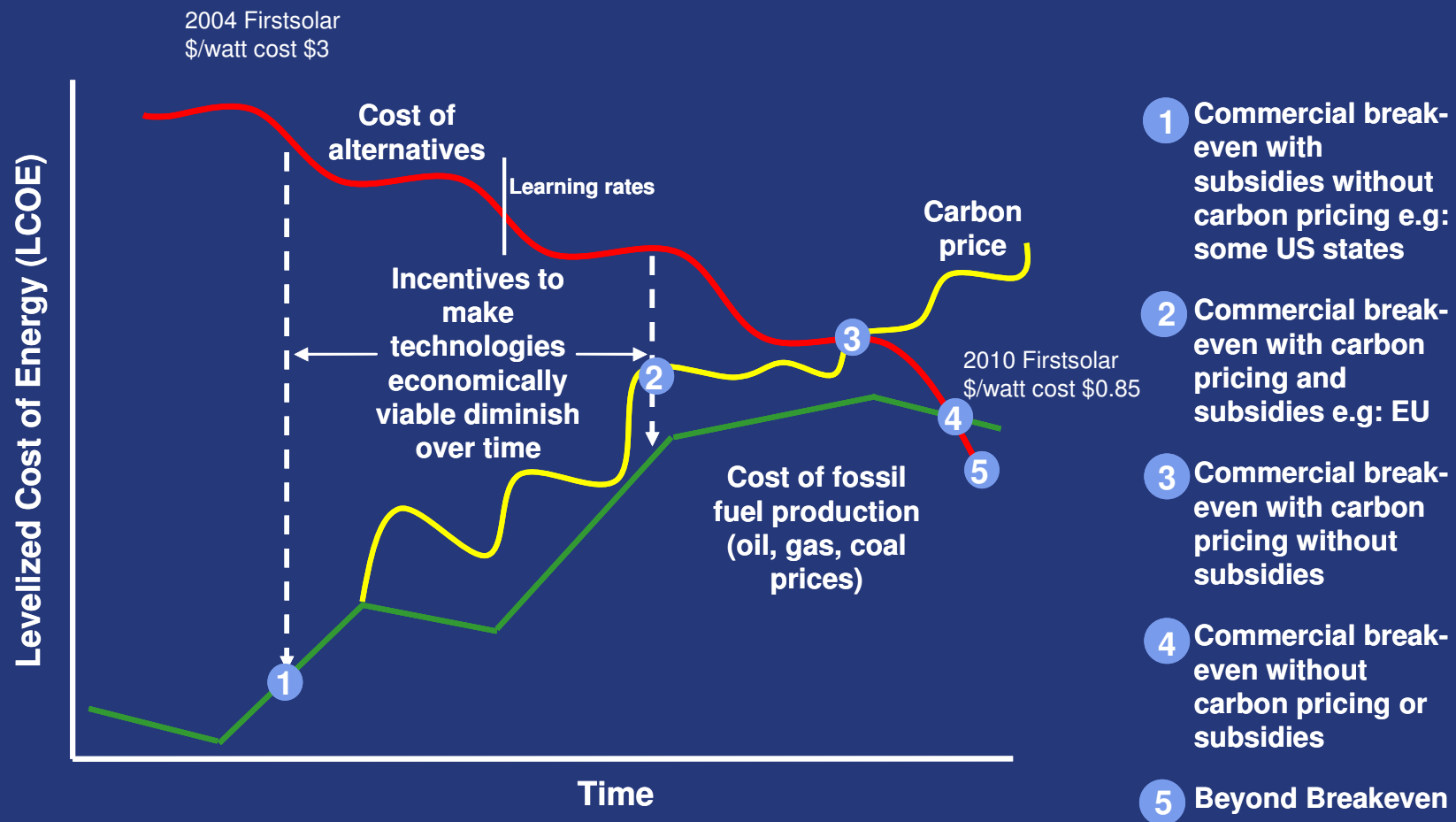


Introduction

- Renewable scale-up can satisfy multiple policy & economic goals: emissions targets, energy security & job and industry creation
- Investors want Transparency, Longevity and Certainty – “TLC” to deploy capital in scale and minimize risk
- TLC at the “right price” can be achieved with efficient policy design, striking a fair balance between public and private sector interests, creating a net benefit to society as a whole
- Advanced feed-in tariff (FiT) policies are extremely effective in generating a volume response and creating jobs with TLC
 - Revenue by vintage year is known with certainty
- The US renewable policy framework is complex, fragmented and lacks many elements of TLC; stop/start has been the policy experience



Timeline and incentive structure to achieve commercial break-even (grid parity) for a technology



Source: Firstsolar, DBCCA analysis, 2008.



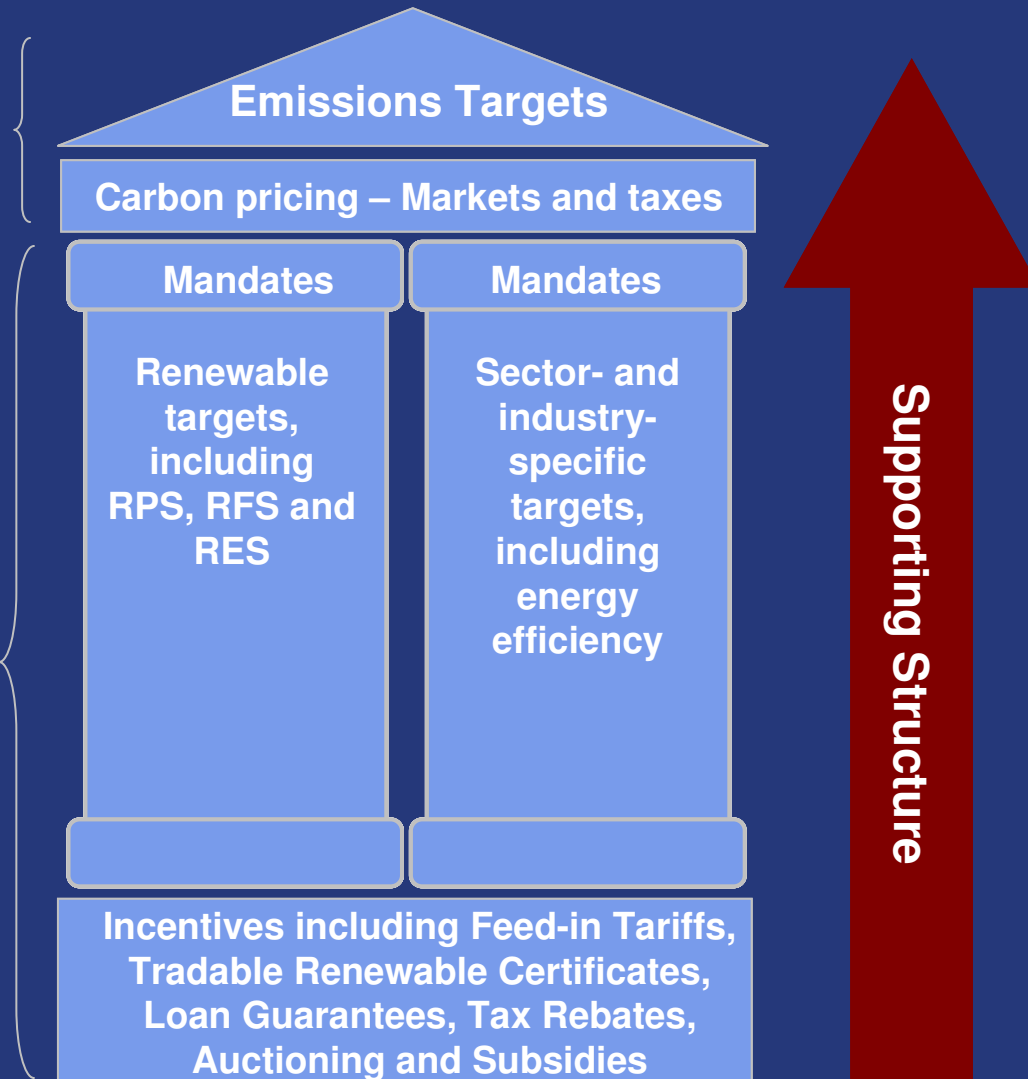
Stylized current policy structure and relationships

Long-term policy pricing the externality

Transition to:

- Short-term cost reduction

- Or behavioral barriers



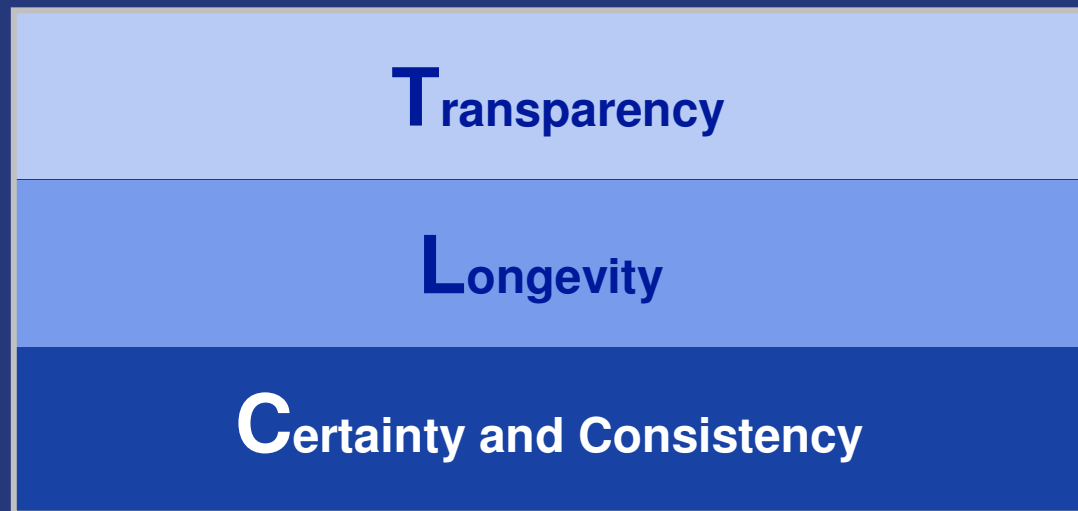
DB Climate Change Advisors

Deutsche Bank Group



What do investors want from policy?

Investors essentially look for 3 key drivers in policy:



In assessing the potential success of policies, these factors should be taken into account.

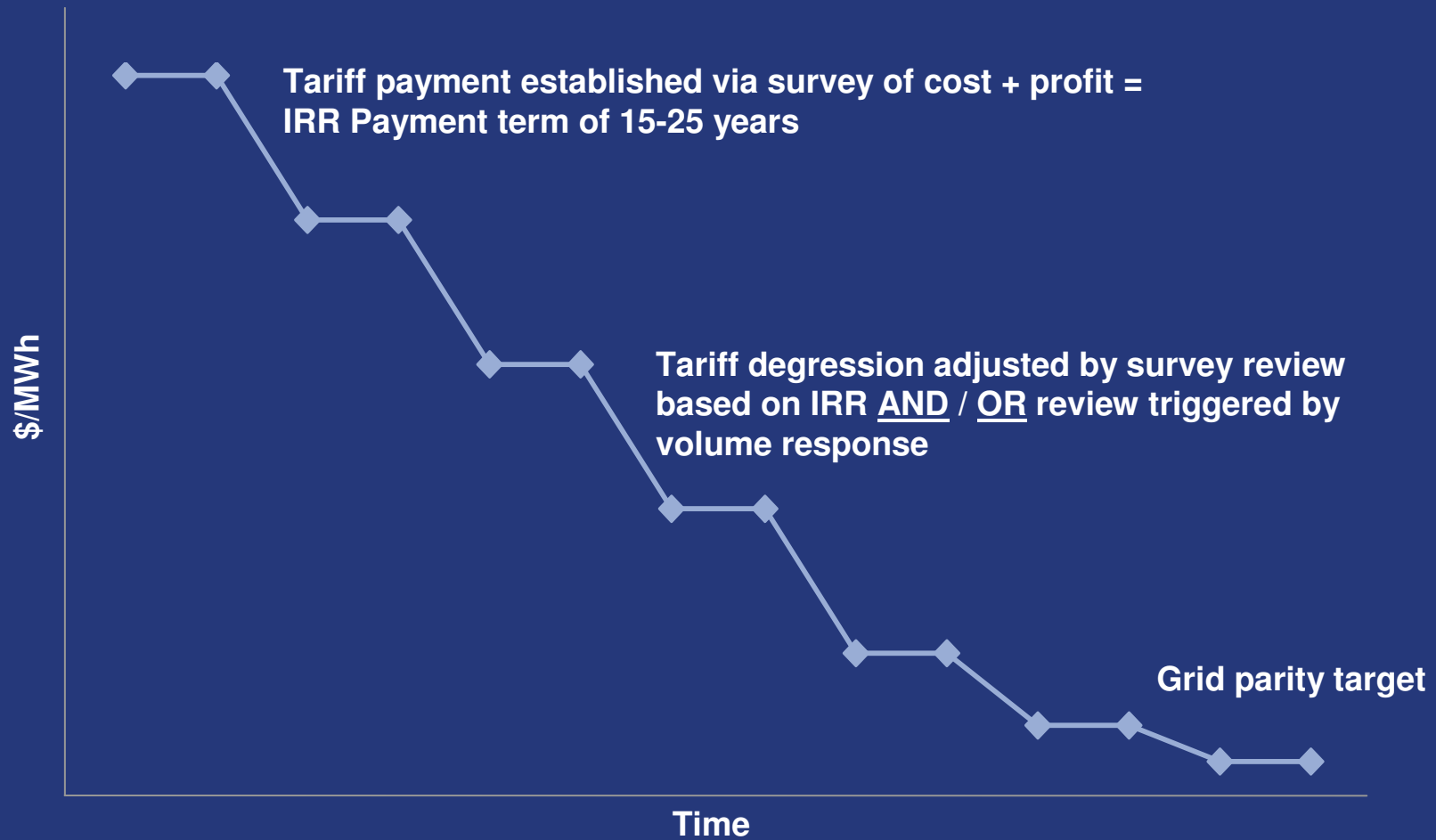


FiTs are integrated into national energy policy in Europe

- Germany, Spain, France & the Netherlands have advanced FiT policies and have attracted capital, created jobs & scaled renewable deployment
- Core elements include: linkages to mandates and targets, standard offer, longevity of payment terms, interconnection and adaptability
- Prices are set relative to an IRR target and adjust to market supply/demand dynamics
- Prices adjust via grid parity target, degression or periodic review
- In evaluating the costs & benefits of renewable payments to achieve scale, a number of factors need to be considered:
 1. How much clean power (as % total supply) is delivered from the policy?
 2. How many jobs are created as a consequence?
 3. What is the cost to the electricity rate payer or taxpayer as a result of the incentives and public spending programs?



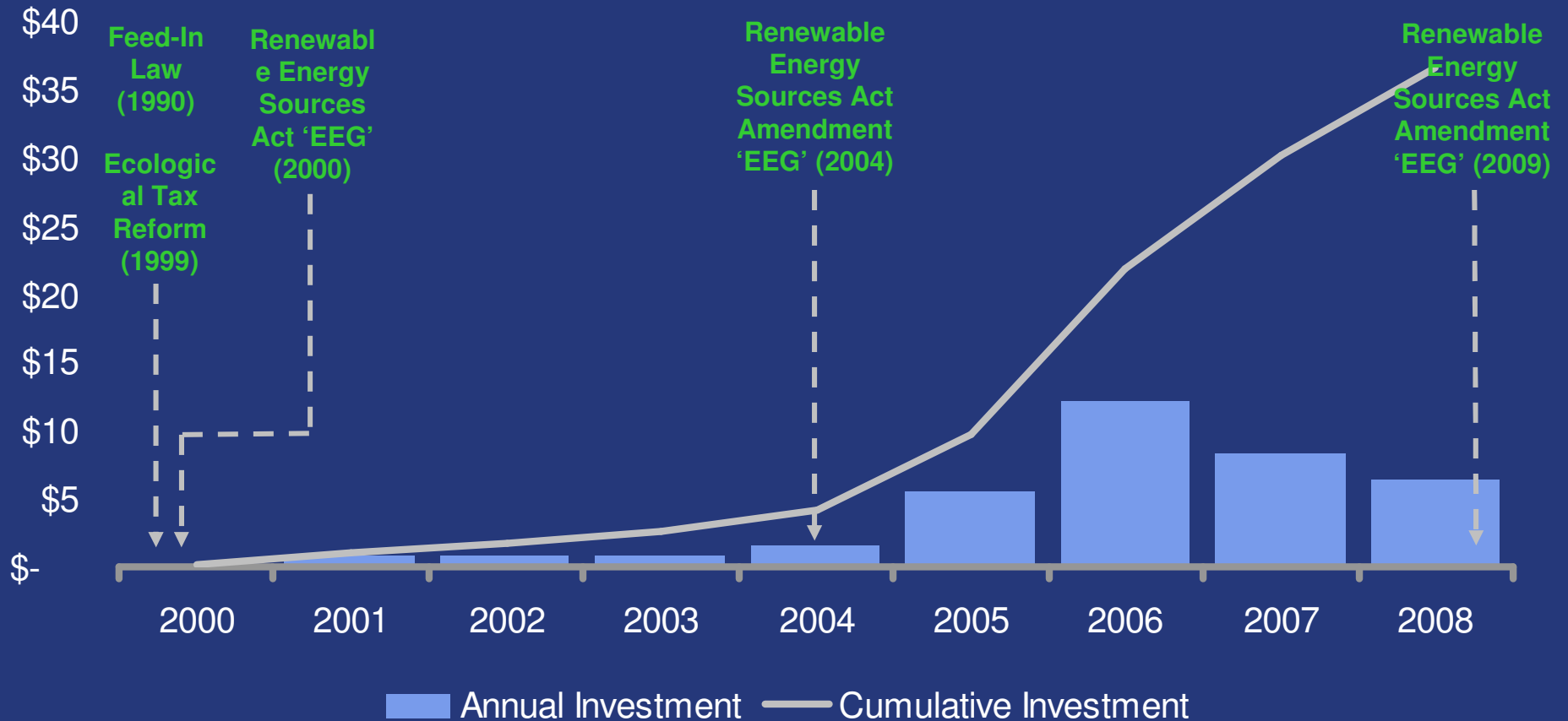
Efficient tariff pathway to grid parity: *Policy matches asset life*



Key aspects of an advanced feed-in tariff design

<u>FIT Design Features</u>	<u>Key Factors</u>	<u>TLC at the Right Price</u>	<u>France</u>	<u>Germany</u>	<u>Netherlands</u>	<u>Ontario</u>	<u>Spain</u>
<u>Policy & Economic Framework</u>	"Linkage" to mandates & targets	Yes	23% by 2020	30% by 2020	20% by 2020	Halt coal use by 2014	20% by 2020
<u>Core Elements</u>	Eligible technologies	All renewables eligible	Wind, Solar, Geothermal, Small hydro, Biomass, Biogas	Wind, Solar, Geothermal, Small hydro, Biomass, Biogas	Wind, Solar, Biomass, Biogas, CHP	Wind, Solar, Hydro, Biomass, Biogas	Wind, Solar (PV & CSP), Geo, Small hydro, Biomass, Biogas
	Specified tariff by technology	Yes	Yes	Yes	Yes	Yes	Yes
	Standard offer/ guaranteed payment	Yes	Yes	Yes	Yes	Yes	Yes
	Interconnection	Yes	Yes	Yes	Yes	Yes	Yes
	Payment term	15-25yrs	15-20yrs	20yrs	15yrs	20yrs	15-25yrs
<u>Supply & Demand</u>	Must take	Yes	No	Yes	No	Yes	Yes
	Who operates (most common)	Open to all	IPPs; communities; utilities	IPPs; communities; utilities	IPPs; communities	IPPs; communities	IPPs, communities; utilities
<u>Fixed Structure & Adjustment</u>							
How to set price	Fixed vs. variable price	Fixed	Fixed	Fixed	Hybrid	Fixed	Both
	Generation cost vs. avoided cost	Generation	Generation	Generation	Generation	Generation	Generation
	IRR target	Yes	8%	5-7%	No	11%	7-10%
How to adjust price	Degression	Yes	Wind only	Yes	No	No	No
	Periodic review	Yes	No	Yes	Yes	Yes	Yes
	Grid parity target	Yes	No	Yes	No	No	No
Caps	Project size cap	Depends on context	Varies	No	Yes	PV only	Yes
Policy interactions	Eligible for other incentives	Yes - eligible to take choice	Yes	Yes	Yes	Yes	Yes
Streamlining	Transaction costs minimized	Yes	Yes	Yes	No	Yes	No

German legislation boosts renewable energy investment



Annual Investment CAGR 2000 - 2008 = 55%
Cumulative Investment CAGR 2000 - 2008 = 93%

Note: Investment figures are based on New Energy Finance's PE/VC, Asset Financing and Public Markets database, which comprises of disclosed investment amounts. This may not accurately represent all investments made in the renewable energy sector during this time period. Market cap data is sourced from Bloomberg, 2009.

DB Climate Change Advisors
 Deutsche Bank Group



Evaluating costs and benefits of the German FiT

2004-2006:

Electricity Sector Costs Incurred:

Differential cost (Premium above calculation cost):	€8.6 billion
Balancing cost (2006 estimate of €0.3 – €0.6 billion ² x 3 years):	€0.9 – €1.8 billion
Expansion of grid:	€1 billion (estimate)

Effect on Energy Security:

Electricity import savings:	€2.2 billion
-----------------------------	--------------

Merit Order Effect:

Avoided electricity generation of the most expensive fossil fuel plants:	€9.4 billion
--	--------------

Additional Benefits:

- *Jobs created:* By June 2009, over 280,000 jobs in the renewable energy industry were created, of which the German government attributes about 66% occurring directly from the EEG. The estimated net employment effect in 2006 was 67,000 to 78,000 new jobs created.
- *Domestic Electricity Share:* Renewable energy generation as a share of gross electricity consumption increased from 4.3% in 1997 to 15.1% in 2008. Germany has met its 2010 target to obtain 12.5% of electricity from renewable energy and is on track to meet its 2020 goal of 30%.



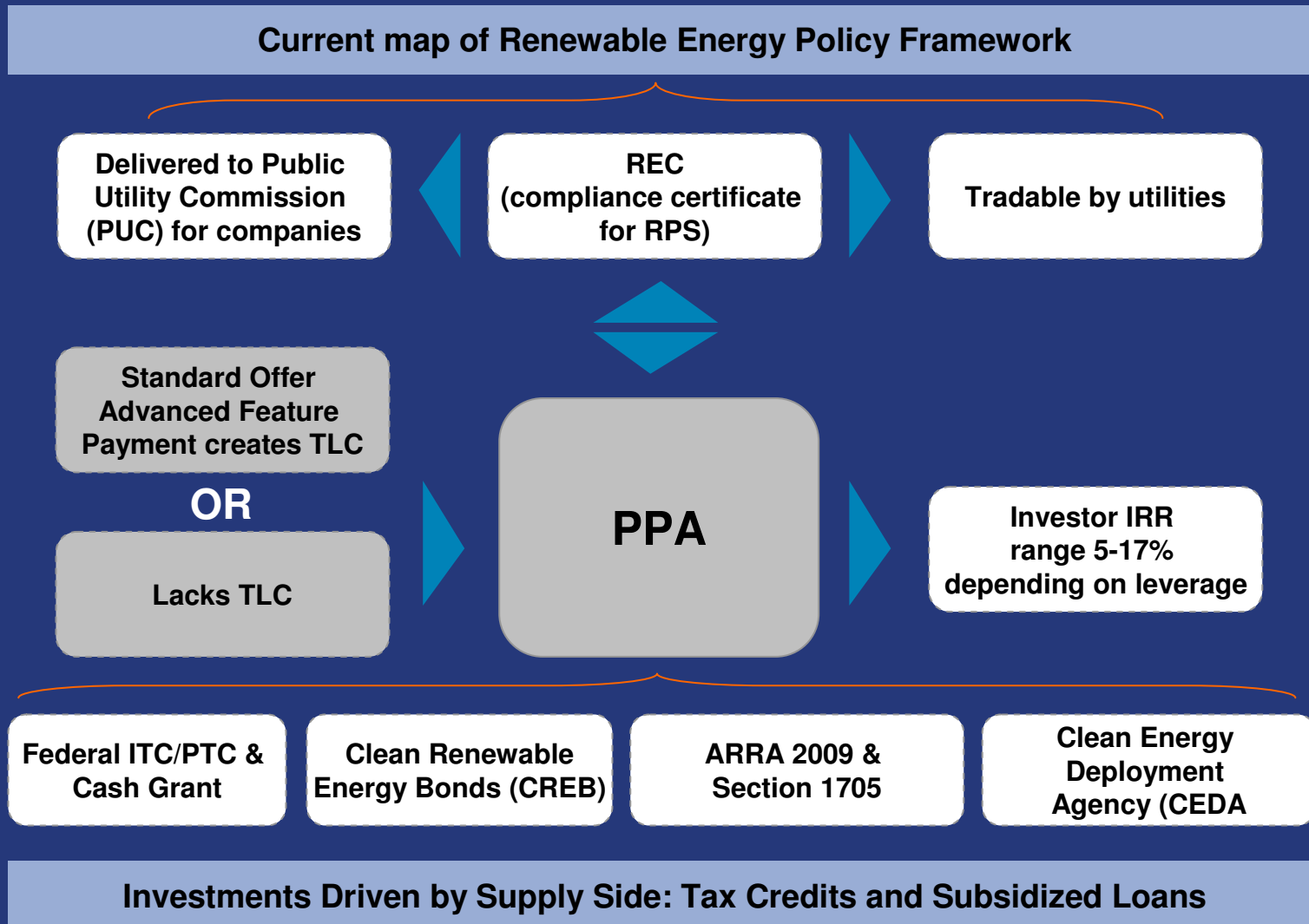
US Renewable policy highly complex:

Relies on market mechanisms

- Fragmented electricity markets, divergent regulatory structures, disparate interconnect capabilities & wide variation in natural resource abundance
- In contrast to Europe, electricity markets disaggregated at the state and local levels
- Renewable portfolio standards (RPS) volume targets are core of policy structure; renewable energy credits (RECs) are generated for compliance
- Power purchase agreements (PPAs) are the key instruments for pricing electricity and complying with RPS mandates
- Federal incentives are layered into PPAs through a combination of tax benefits and loan guarantees and have been on/off
- RPS and RECs bundled into PPAs perform many functions of a FiT but lack transparency



Summary of various renewable energy subsidy mechanisms



Disclaimer

DB Climate Change Advisors is the brand name for the institutional climate change investment division of Deutsche Asset Management, the asset management arm of Deutsche Bank AG. In the US, Deutsche Asset Management relates to the asset management activities of Deutsche Bank Trust Company Americas, Deutsche Investment Management Americas Inc. and DWS Trust Company; in Canada, Deutsche Asset Management Canada Limited (Deutsche Asset Management Canada Limited is a wholly owned subsidiary of Deutsche Investment Management Americas Inc); in Germany and Luxembourg: DWS Investment GmbH, DWS Investment S.A., DWS Finanz-Service GmbH, Deutsche Asset Management Investmentgesellschaft mbH, and Deutsche Asset Management International GmbH; in Denmark, Finland, Iceland, Norway and Sweden, Deutsche Asset Management International GmbH ; in Australia, Deutsche Asset Management (Australia) Limited (ABN 63 116 232 154); in Hong Kong, Deutsche Asset Management (Hong Kong) Limited; in Japan, Deutsche Asset Management Limited (Japan); in Singapore, Deutsche Asset Management (Asia) Limited (Company Reg. No. 198701485N) and in the United Kingdom, RREEF Limited, RREEF Global Advisers Limited, and Deutsche Asset Management (UK) Limited; in addition to other regional entities in the Deutsche Bank Group.

This material is intended for informational purposes only and it is not intended that it be relied on to make any investment decision. It does not constitute investment advice or a recommendation or an offer or solicitation and is not the basis for any contract to purchase or sell any security or other instrument, or for Deutsche Bank AG and its affiliates to enter into or arrange any type of transaction as a consequence of any information contained herein. Neither Deutsche Bank AG nor any of its affiliates, gives any warranty as to the accuracy, reliability or completeness of information which is contained in this document. Except insofar as liability under any statute cannot be excluded, no member of the Deutsche Bank Group, the Issuer or any officer, employee or associate of them accepts any liability (whether arising in contract, in tort or negligence or otherwise) for any error or omission in this document or for any resulting loss or damage whether direct, indirect, consequential or otherwise suffered by the recipient of this document or any other person.

The views expressed in this document constitute Deutsche Bank AG or its affiliates' judgment at the time of issue and are subject to change. This document is only for professional investors. This document was prepared without regard to the specific objectives, financial situation or needs of any particular person who may receive it. The value of shares/units and their derived income may fall as well as rise. Past performance or any prediction or forecast is not indicative of future results. No further distribution is allowed without prior written consent of the Issuer.

The forecasts provided are based upon our opinion of the market as at this date and are subject to change, dependent on future changes in the market. Any prediction, projection or forecast on the economy, stock market, bond market or the economic trends of the markets is not necessarily indicative of the future or likely performance.

For Investors in the United Kingdom:

Issued in the United Kingdom by Deutsche Asset Management (UK) Limited of One Appold Street, London, EC2A 2UU. Authorised and regulated by the Financial Services Authority. This document is a "non-retail communication" within the meaning of the FSA's Rules and is directed only at persons satisfying the FSA's client categorisation criteria for an eligible counterparty or a professional client. This document is not intended for and should not be relied upon by a retail client.

When making an investment decision, potential investors should rely solely on the final documentation relating to the investment or service and not the information contained herein. The investments or services mentioned herein may not be appropriate for all investors and before entering into any transaction you should take steps to ensure that you fully understand the transaction and have made an independent assessment of the appropriateness of the transaction in the light of your own objectives and circumstances, including the possible risks and benefits of entering into such transaction. You should also consider seeking advice from your own advisers in making this assessment. If you decide to enter into a transaction with us you do so in reliance on your own judgment.

For Investors in Australia:

In Australia, Issued by Deutsche Asset Management (Australia) Limited (ABN 63 116 232 154), holder of an Australian Financial Services License. An investment with Deutsche Asset Management is not a deposit with or any other type of liability of Deutsche Bank AG ARBN 064 165 162, Deutsche Asset Management (Australia) Limited or any other member of the Deutsche Bank AG Group. The capital value of and performance of an investment with Deutsche Asset Management is not guaranteed by Deutsche Bank AG, Deutsche Asset Management (Australia) Limited or any other member of the Deutsche Bank Group. Investments are subject to investment risk, including possible delays in repayment and loss of income and principal invested.

For Investors in Hong Kong:

Interests in the funds may not be offered or sold in Hong Kong or other jurisdictions, by means of an advertisement, invitation or any other document, other than to Professional Investors or in circumstances that do not constitute an offering to the public. This document is therefore for the use of Professional Investors only and as such, is not approved under the Securities and Futures Ordinance (SFO) or the Companies Ordinance and shall not be distributed to non-Professional Investors in Hong Kong or to anyone in any other jurisdiction in which such distribution is not authorised. For the purposes of this statement, a Professional investor is defined under the SFO.

For Investors in MENA region:

This information has been provided to you by Deutsche Bank AG Dubai (DIFC) branch, an Authorised Firm regulated by the Dubai Financial Services Authority. It is solely directed at Market Counterparties or Professional Clients of Deutsche Bank AG Dubai (DIFC) branch, which meets the regulatory criteria as established by the Dubai Financial Services Authority and may not be delivered to or acted upon by any other person.

DB Climate Change Advisors



Deutsche Bank Group