



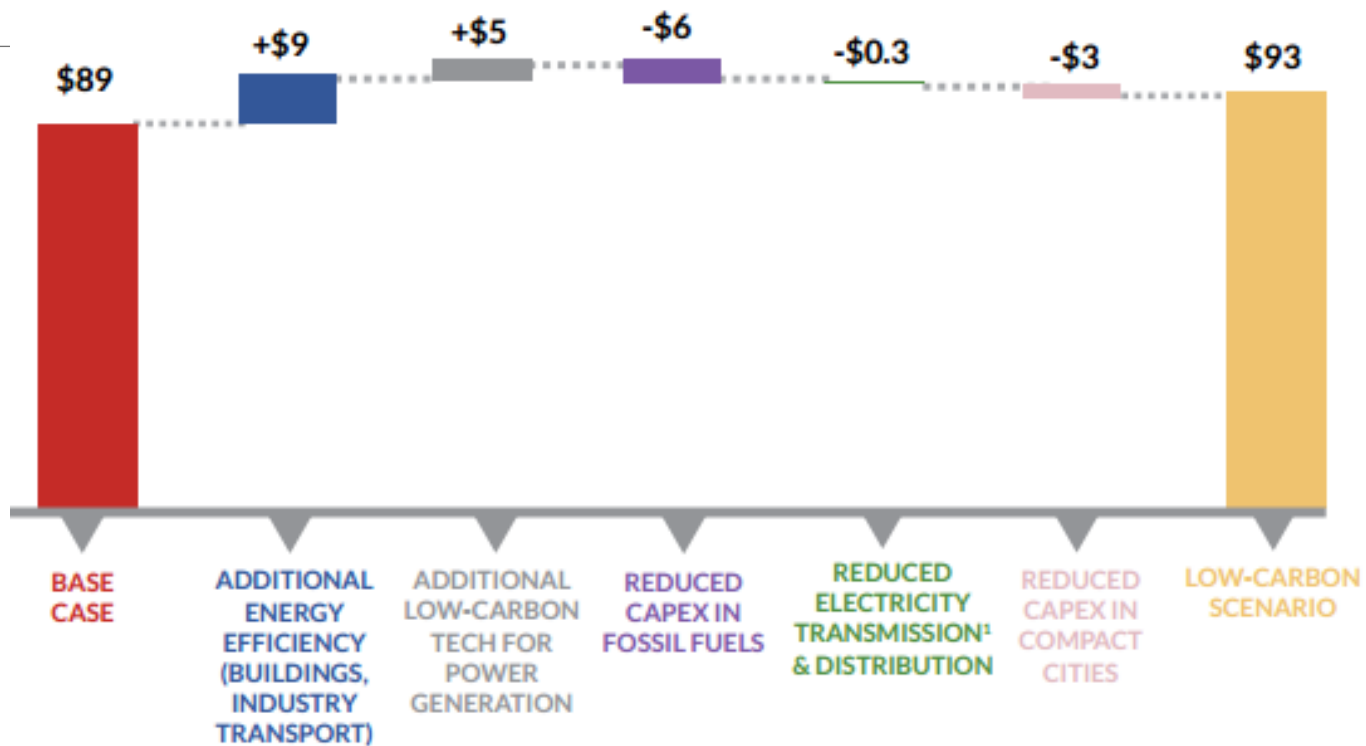
Mobilising institutional investors and the bond markets for renewable energy infrastructure

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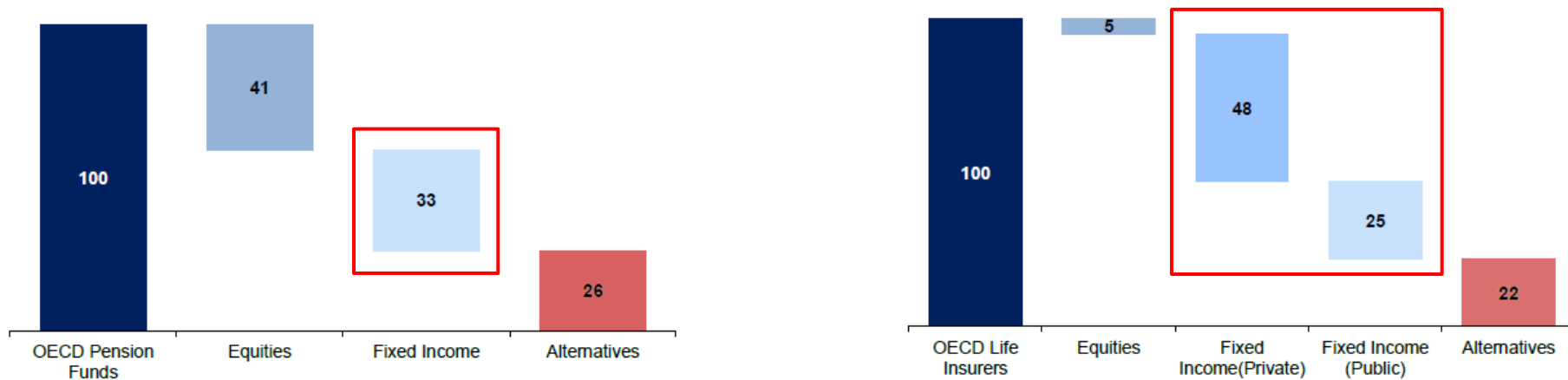
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CONTEXT – ALIGNING THE TRILLIONS

- (1) \$93 tn investment needs in the next 15 years for a low carbon scenario
- (2) \$120 tn institutional investors are largest investors in the \$97 tn debt capital securities markets
- (3) Asset allocation favours bonds – especially for insurers

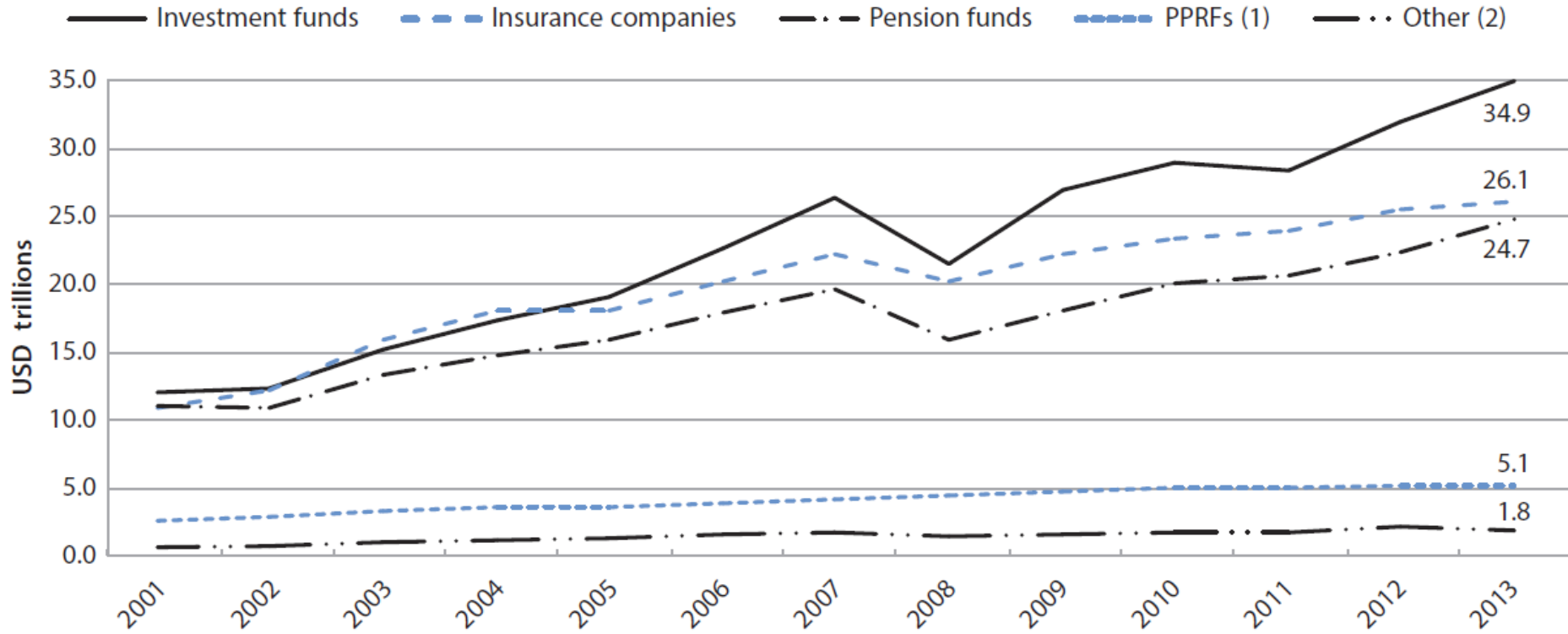


Sources: NCE (2015); OECD (2015)





1% of large OECD pension fund assets invested directly in infrastructure



Source: OECD Global Pension Statistics, Global Insurance Statistics and Institutional Investors databases, and OECD staff estimates.

* based on large OECD pension funds, covering \$10+tn

** BNEF estimates



What are the barriers to institutional investment in renewable energy infrastructure?

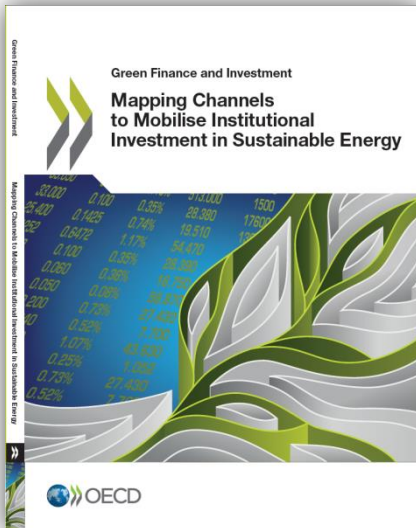
- **Weak, uncertain or counterproductive environmental, energy and climate policies**
 - Direct investing challenges
 - Asset and liability matching (ALM) application issues; diversification and exposure limits
 - Need scale >\$50Bn AuM and dealflow to maintain costly team
 - Min \$100M deal size; expensive and time consuming due diligence; higher transaction costs;
 - Regulatory and policy issues
 - Political uncertainty
 - Accounting rules e.g. mark to market for illiquid assets
 - Lack of consistent and quality historical data
 - Exit of banks (Basel III/deleveraging)
 - Little historical pricing data or indices for investments such as private placement debt
- **Regulatory policies with unintended consequences**
 - Unpredictable, fragmented, complex and short duration policy support
 - Retroactive support cuts, switching incentives (FIT to CfD) or starting stop (PTC)
 - Unrelated policy objective discouragement e.g. E0 unbundling preventing majority ownership of both transmission and generation/production
 - Fiduciary duty debate
 - Special species of risk, e.g. technology and volumetric require expertise and resources
 - Competition for capital with other traditional infrastructure assets
- **A lack of suitable financial vehicles with attributes sought by institutional investors**
 - Liquidity trade-off with connection to underlying asset and associated benefits: difficult to offer liquidity without asset discount, churn and leverage in fund
 - Small pipeline of projects; high transaction costs; minimum deal size and definition uncertainty
- **A shortage of objective information, skills and data to assess transactions and underlying risks**
 - Challenges with securitisation
 - Historical track records scarce, opaque process
 - Absence of monoline insurers since financial crisis



OECD policy recommendations for G20: Overcoming barriers and mobilising institutional investors for renewable energy infrastructure

Barriers to institutional investment

- Weak, uncertain or counterproductive environmental, energy and climate policies
- Regulatory policies with unintended consequences
- Lack of suitable financial vehicles with attributes sought by institutional investors
- Shortage of information, knowledge and data to assess portfolios and investments and underlying risks/returns



Establish pre-conditions for institutional investment

Ensure a stable “investment grade” policy environment - evaluate and fix unintended regulatory impacts

Address market failures (incl. lack of carbon pricing & remove fossil fuel subsidies)

Provide a national infrastructure road map & pipeline

Facilitate the development of liquid financing instruments (e.g. green bonds) and risk mitigants

Promote market transparency, disclosure, standardisation and improve data availability

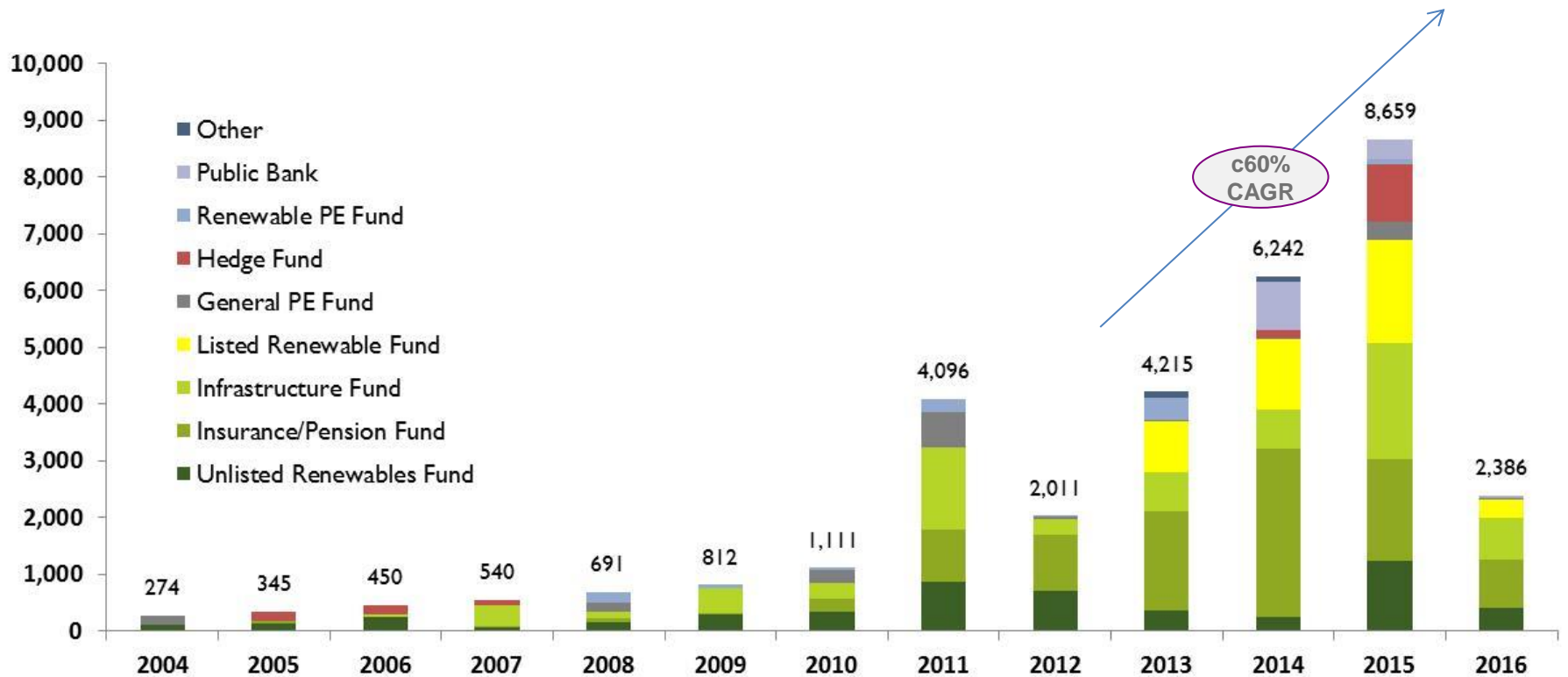
Reduce the transaction costs of green investment

Establish a “green investment bank” or refocus existing public financial institutions



Rapid growth in institutional equity investment in European renewable energy infrastructure

INSTITUTIONAL EQUITY INVESTMENT IN EU RENEWABLE PROJECTS (€ MM.) BY INVESTOR TYPE



Technology Key	
Wind - Offshore	Wind - Onshore
Wind - Diversified	
Solar - PV	Solar - CSP
Solar - CPV	
Geothermal	
Biofuels	
Biomass	
Waste to Energy	
Hydro	
Diversified Sustainable Energy	



LISTED (Direct)	(D)	Touwsrivier CPV Plant (South African pension funds)	(H) No public disclosure of pension funds investment in specific corporate green bonds available. Many issuances noted to have significant institutional investor interest such as EDF Energies Nouvelles and Vestas Euro Bond	Debt
		Sustainable energy projects have not yet independently listed on public markets	CPFL Renováveis (Previ)	Equity
INTERMEDIATED	(C) Listed	World Bank Green Bonds (Diverse lis)	(G) No public disclosure of pension fund investment in green bond funds that include corporate and project bonds available	Debt
		NRG Yield (Texas Teachers, CalSTRs)	No public disclosure of pension fund investment in index funds or ETFs available	Equity
INTERMEDIATED	(B) Unlisted	Cape Wind (PensionDanmark)	(F) Invenergy Wind LLC (AMP Capital Infra Debt LPs)	Debt
		Walney (Ampere LPs)	EEW (EQT Infra II LPs)	Equity
UNLISTED (Direct)	(A)	Westmill (Lancashire County Pension Fund)	(E) Boralex (CDPQ)	Debt
		Walney (PGGM)	SolarReserve (CalPERs)	Equity

LISTED (Direct)

INTERMEDIATED

UNLISTED (Direct)

Debt

Equity

Debt

Equity

Debt

Equity

Debt

Equity

PROJECT

PURE-PLAY CORPORATES

LISTED

UNLISTED

Sources: Kaminker, C. et al. (2013), OECD (2015) Mapping Channels to Mobilise Institutional Investment in Sustainable Energy

