Confidence must be earned

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January 2019

Climate Change

Executive Summary

MULTIPLE FORCES ON CLIMATE CHANGE

– **Climate change is now recognized as the risk #1**
– **Multiple forces to tackle the problem:**
  - COP21 as a game changer
  - Multiple forms of regulation
– **Investors are facing a major shift:**
  - Risk Management approach
  - Increasing number of simple and transparent investment solutions

AMUNDI PLAYS A PIVOTAL ROLE IN THIS FIELD

– **Innovative off-the-shelf solutions:**
  - …on all asset classes: debt, equity, real-assets
  - …through innovative approaches [1] : Joint Ventures, Public & Private partnerships, thematic strategies …
– **Bespoke solutions to integrate investors' specificities and constraints**
– **$15bn AUM in energy transition and green growth**

(1) Co-founder of the Portfolio Decarbonization Coalition, one of the first signatories of the *UNPRI*, Member of the *Institutional Investors' Group on Climate Change* (IIGCC) since 2003, signatory of the *Carbon Disclosure Project* and *Water Disclosure Project*. Co-Developer of the first Low carbon indices (see MSCI disclaimer at end of document), joint-venture with EDF and thematic funds.

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A Tipping Point

BEFORE 3 to 5 years ago	TODAY
1 Deniers	1 Acceptance of climate change
2 One of many risks	2 Biggest risk
3 Limited regulations	3 Multiple regulations
4 No global agreement	4 COP 21
5 China blocking	5 China leading
6 Limited interest within populations	6 Millennials
7 Economics only	7 Impacts on health
8 « Abstract » topic	8 Observations in day to day lives
9 Cost of renewables	9 Competitive pricing
10 Few European investors	10 Major world investors

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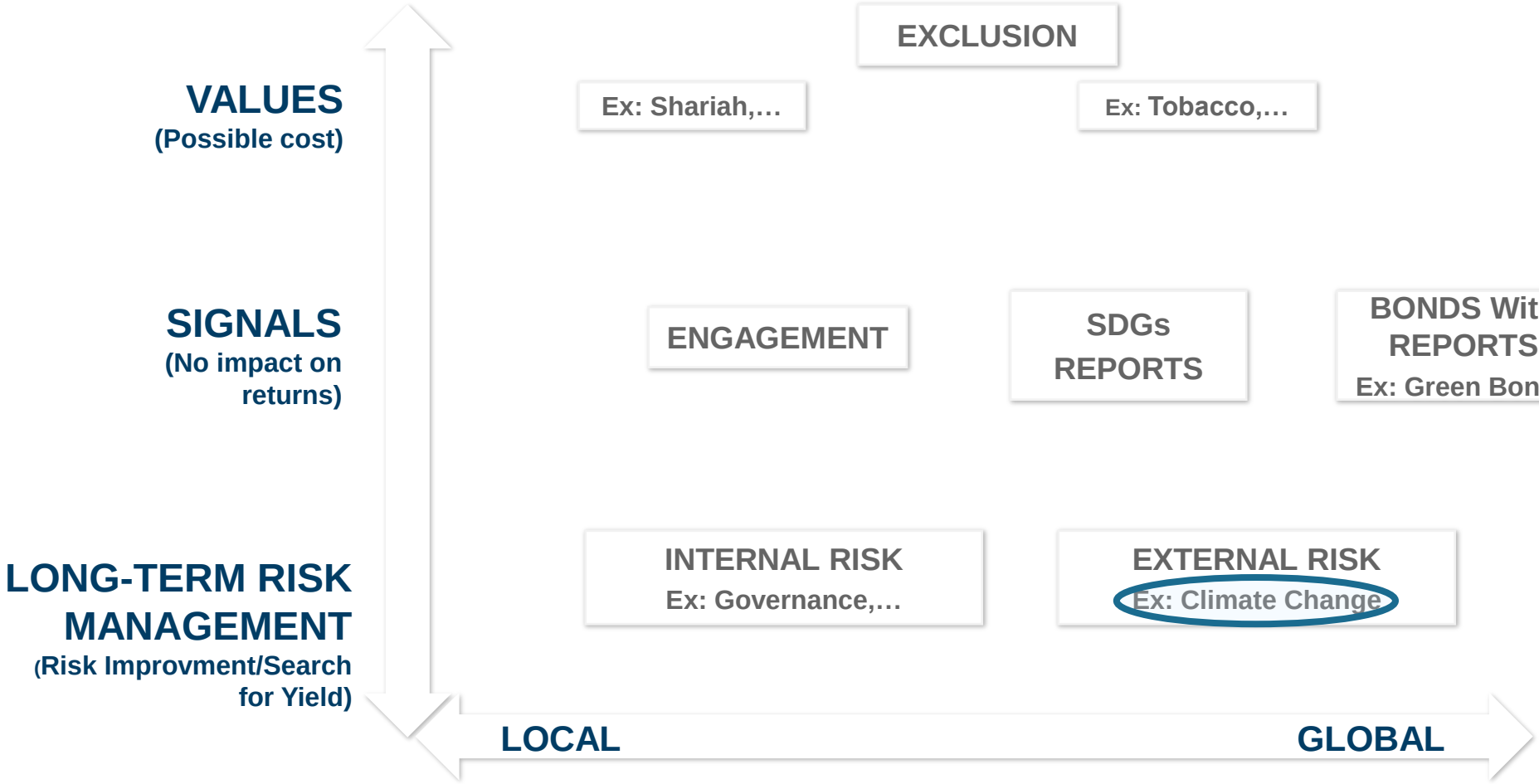
ESG mapping, a growing split of objectives



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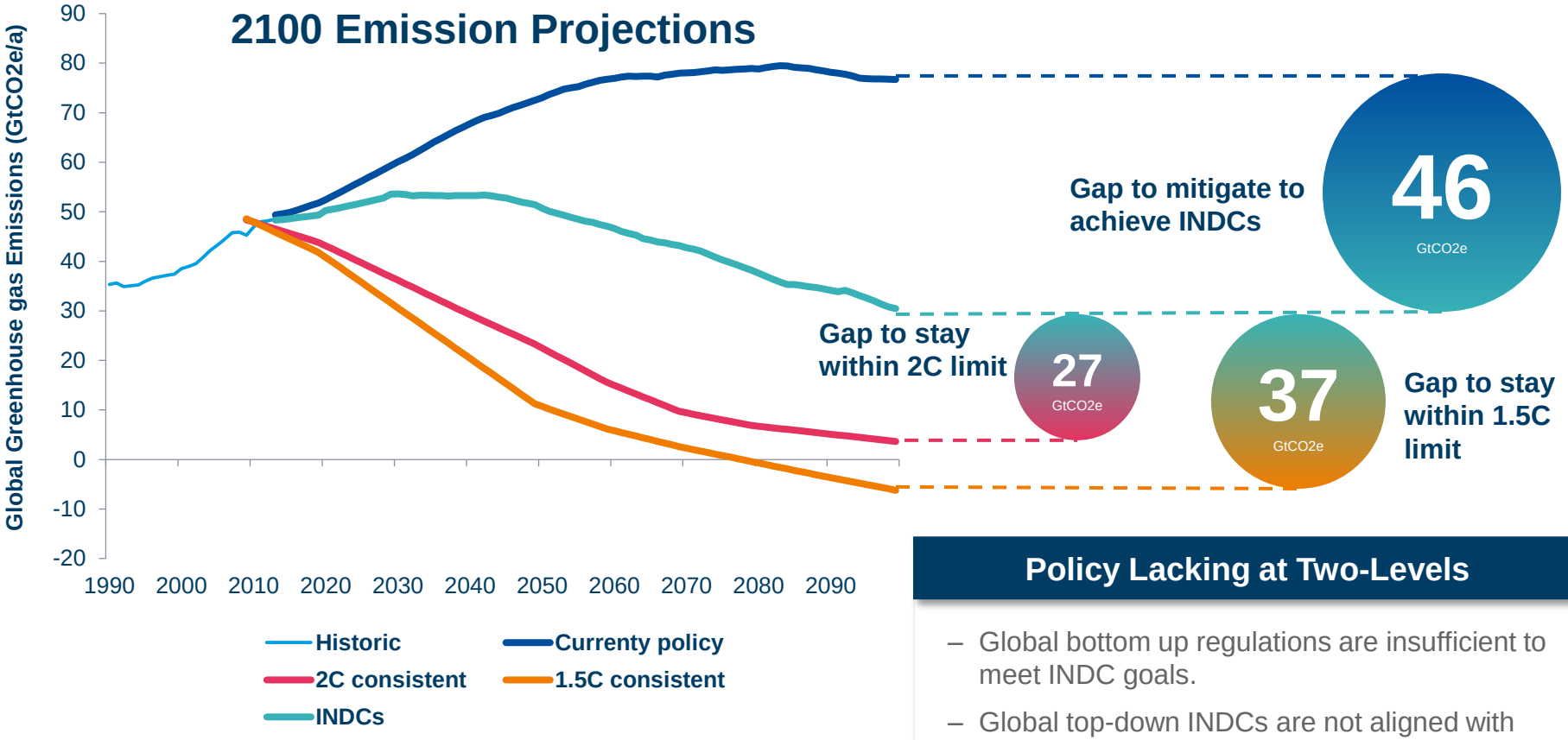
Unprecedented Challenge

Global emission gaps



Policy Lacking at Two-Levels

- Global bottom up regulations are insufficient to meet INDC goals.
- Global top-down INDCs are not aligned with the Paris Agreement goal.

Source: Climate Action Tracker Database, Global emissions time series, updated November 2017. Time series data for INDCs, 2C consistent, 1.5C consistent time series are computed as medians of highest and lowest potential global emission level results.

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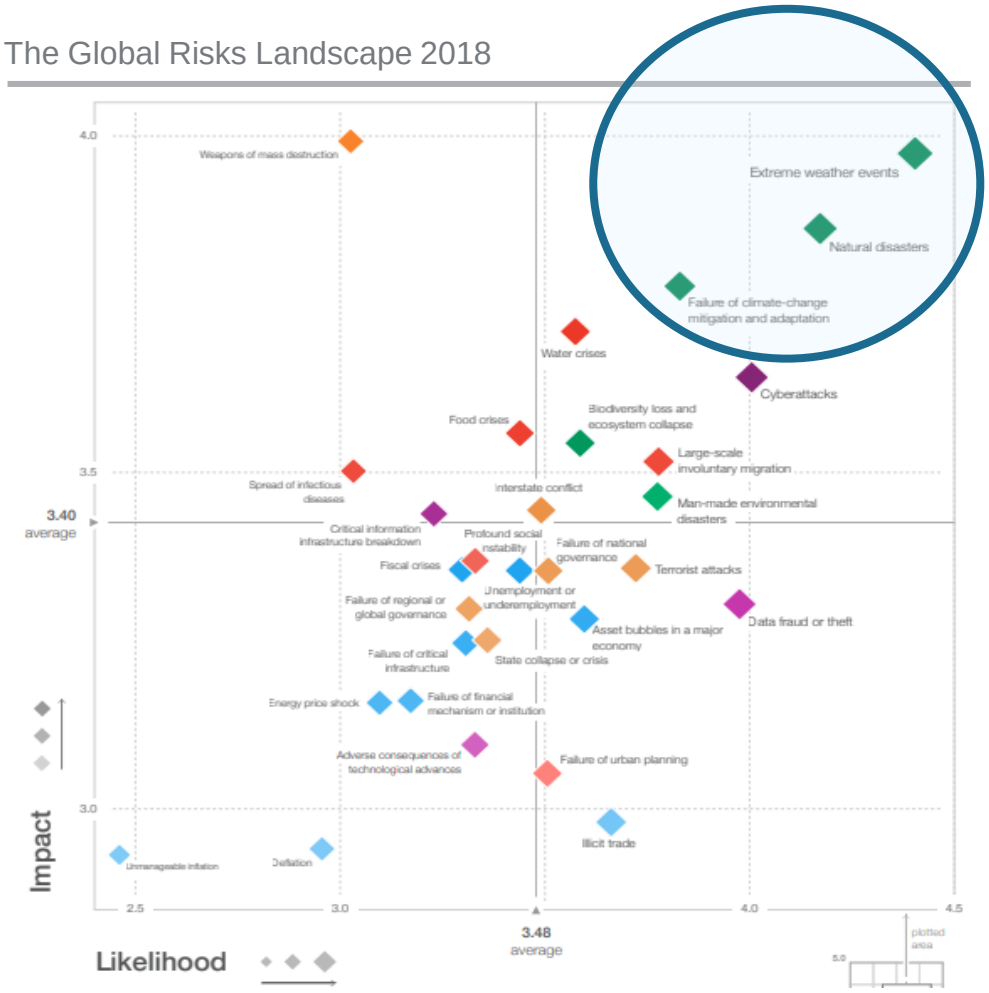
Recognition of Climate change as the Biggest Risk

The Global Risks Landscape 2018



HIGH CLIMATE CHANGE RELATED RISKS

- Now the biggest risk at Davos in terms of impacts and likelihood.
- A clear trend just after the financial crisis.

Source: World Economic Forum, « The Global Risks Report 2018 »

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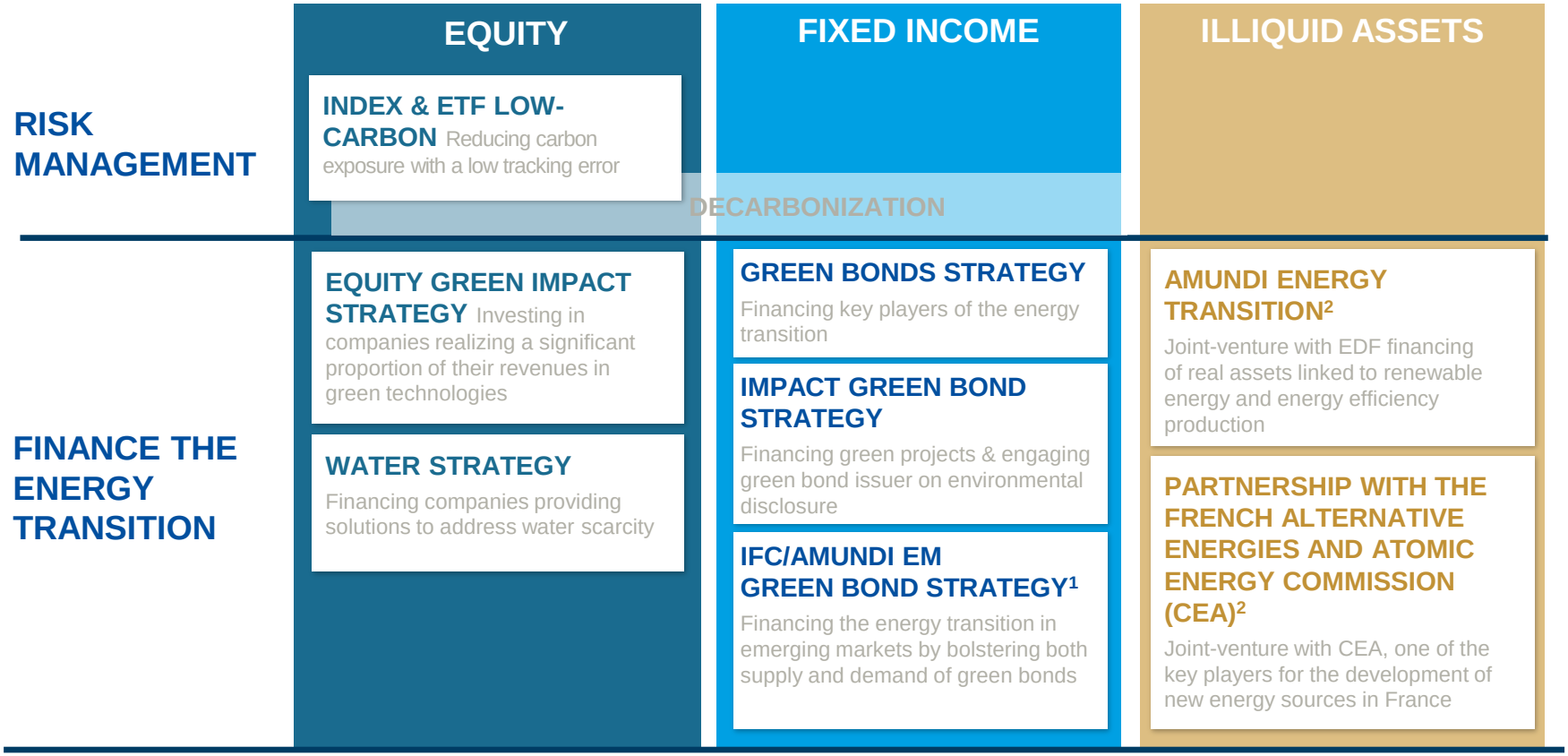
A Call For Innovation to Help Investors



Sources: 1. International Finance Corporation (IFC). Joint-venture currently under construction. 2. Amundi Transition énergétique- "société par actions simplifiée" with a share capital of 11 000 024 € - asset management company authorized by the French regulator AMF ("Autorité des marchés financiers") on April 18th, 2016 under the number GP 16000012 - Head office: 91/93 bd Pasteur, 75015 Paris – France.

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Methodology 1.0: low carbon indices

PROVIDER'S SELECTION	Then	CLIMATE RISK REDUCTION	Then	TE REDUCTION
- **Index Provider** (MSCI)* - **Carbon Data** Provider (MSCI)*		- **Carbon footprint:** X% reduction of Emission Intensity[1] - **Stranded assets** Z% reduction of reserves intensity[2]		- **Optimization of weights** - **Regular rebalancing**

(1) Carbon emissions divided by sales
(2) Potential cumulative emissions from reserves divided by market cap
* As an example

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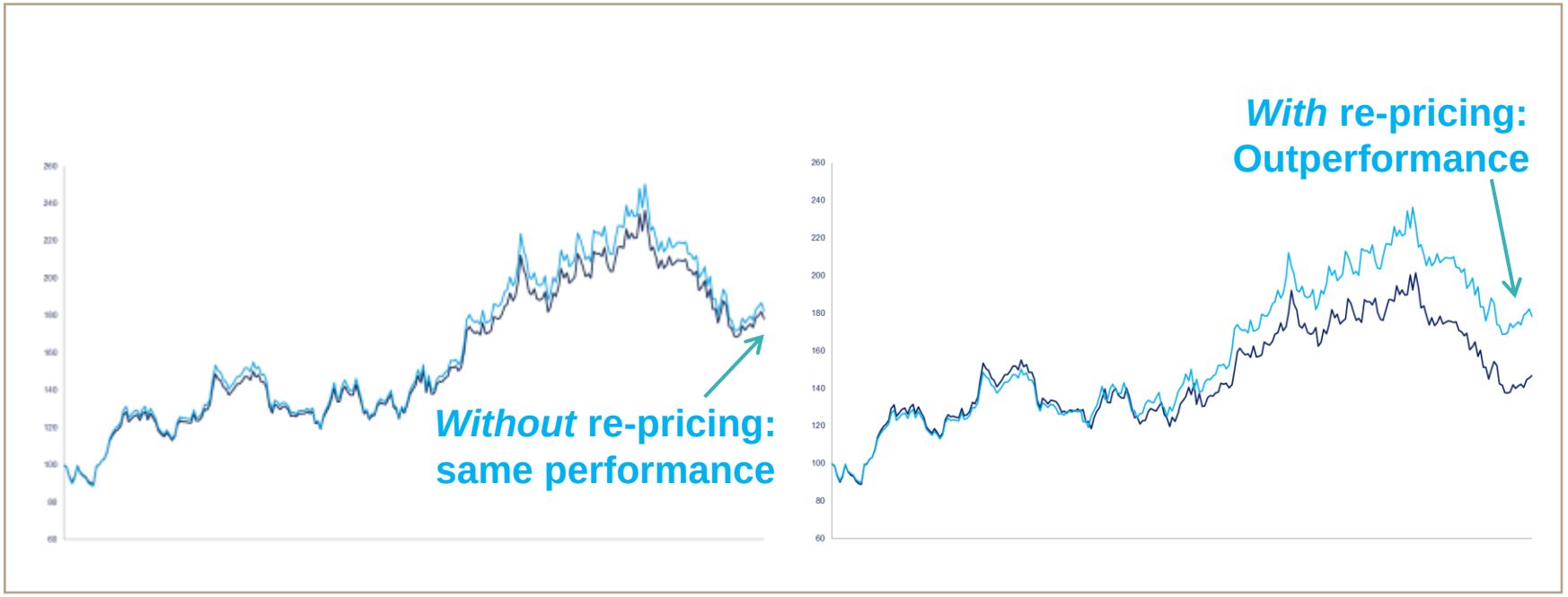
Free option on climate change risk pricing



Benchmark — Low Carbon Low TE

Benchmark — Low Carbon Low TE

« Free Option » :

- Either no *climate change impact*: same performance
- Or a *climate change impact*: outperformance

Source: Amundi Investment Solutions / Random simulations with annual volatility at 20%, annual expected return 7% and a 0,5% TE. **Past market trends are not a reliable indicator of future ones. Past performance does not prejudge future results, nor is it a guarantee of future returns**

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Low carbon leaders Europe

Key Metrics	MSCI	MSCI Europe Low Carbon Leaders
Total Return* (%)	**7.50**	**8.05**
Total Risk* (%)	11.61	11.73
Sharpe Ratio	0.65	0.69
Active Return* (%)	NA	0.55
Tracking Error* (%)	0	**0.76**
Information Ratio	NA	0.72
Turnover** (%)	2.40	11.86
Securities excluded	NA	96
Market cap excluded (%)	NA	23.4
Carbon *Emission* intensity reduction (tCO2/mm USD) (%)	NA	**50**
Carbon *Reserves* intensity reduction (tCO2/mm USD) (%)	NA	**68**

- Excludes:
  - **Largest 20% emitters** with a maximum 30% by weigh from any sector
  - **Largest owners' reserves** up to 50%
- Major reduction of:
  - Carbon *Emissions* Intensity **(-50%)**
  - Carbon *Reserves* Intensity **(-68%)**
- Low tracking error: 0.76 %

Past market trends are not a reliable indicator of future ones. Past performance does not prejudge future results, nor is it a guarantee of future returns. Source: MSCI, Net total return annualized in EUR for the 11/30/2010 to 03/31/2018 period. The cumulative index performance is from MSCI

[1] Over 5 years. [2] Last 12 months. [3] As of end february 2018 .

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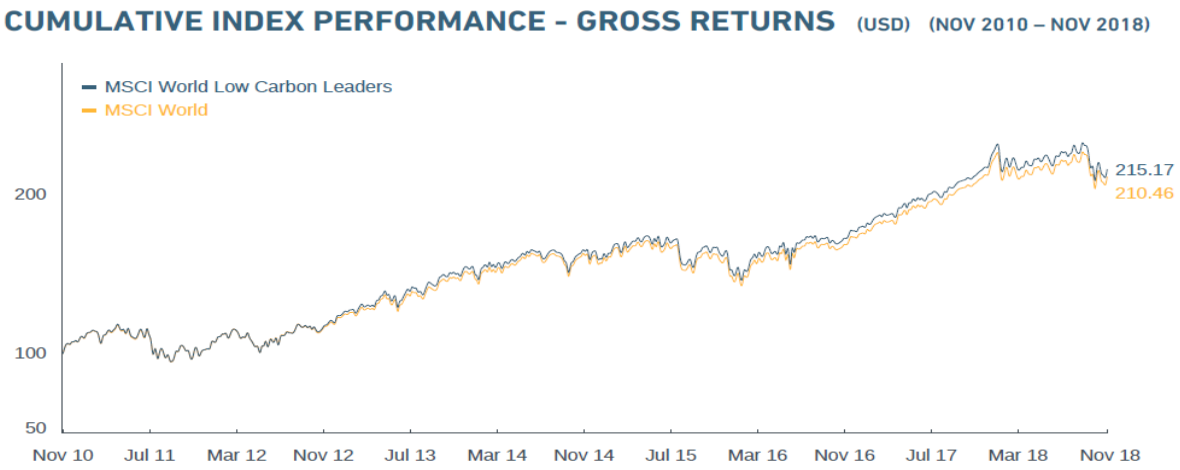
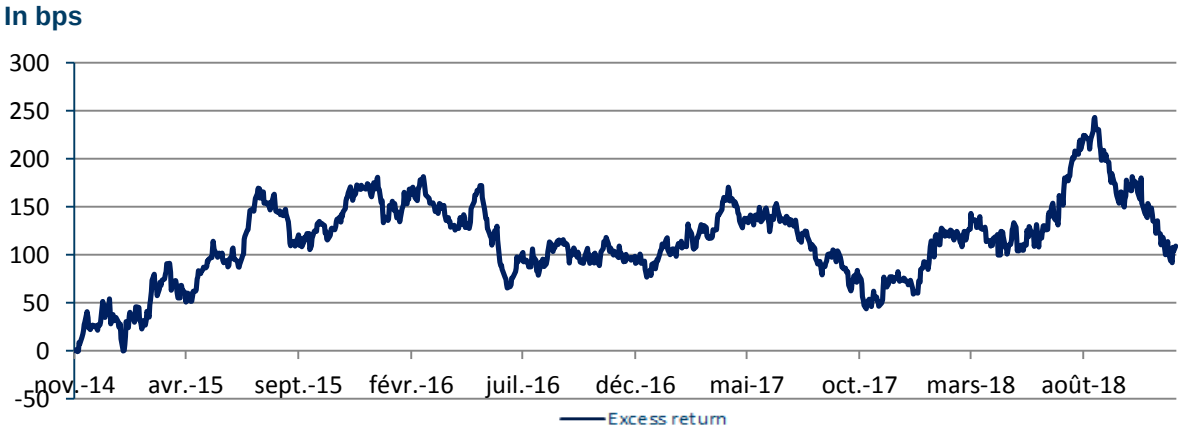
Performances





- Annualized outperformance (2010-2018):
  - World: +30 bp (1)
  - North America: +33 bp
  - Europe: +48 bp
- Even if supposed to be forward-looking
- Performance of concrete investments :
  - Nov 2014 – Dec 2018
  - Outperformance: +25 (2) bp
  - Information ratio(3) : 0.29

Past market trends are not a reliable indicator of future ones. Past performance does not prejudge future results, nor is it a guarantee of future returns. Source: MSCI (1) Net monthly returns annualized in USD for the 11/30/2010 to 11/30/2018 period. Data prior to the launch date (Sep 16, 2014) is back-tested data (2) Net daily returns annualized in EUR for the 11/07/2014 to 31/12/2018 period. Outperformance in basis points. The cumulative index performance is from MSCI (3) A ratio of portfolio returns above the returns of a benchmark (usually an index) to the volatility of those returns

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First step to tackle climate change

Up to now Investors Obstacles	Being Addressed
Time Horizon	No impact on expected returns until pressure on polluting companies takes place
Complexity	Easier to identify the potentially penalized companies
Scalability	Passive management: $14tn

Easy first step (transparent, low cost,…) that can trigger the entry of investors into the game of tackling climate change

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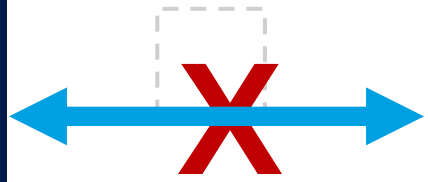
Green Infrastructures' Financing Gap

Green Infrastructures Financings' Needs in *Emerging Markets*



Pools of Assets in *Developed Markets*

- Costly for both parties
- 2 main obstacles:
  - Emerging Markets being considered as too risky by many investors
  - Lack of knowledge on infrastructures financing (even locally)

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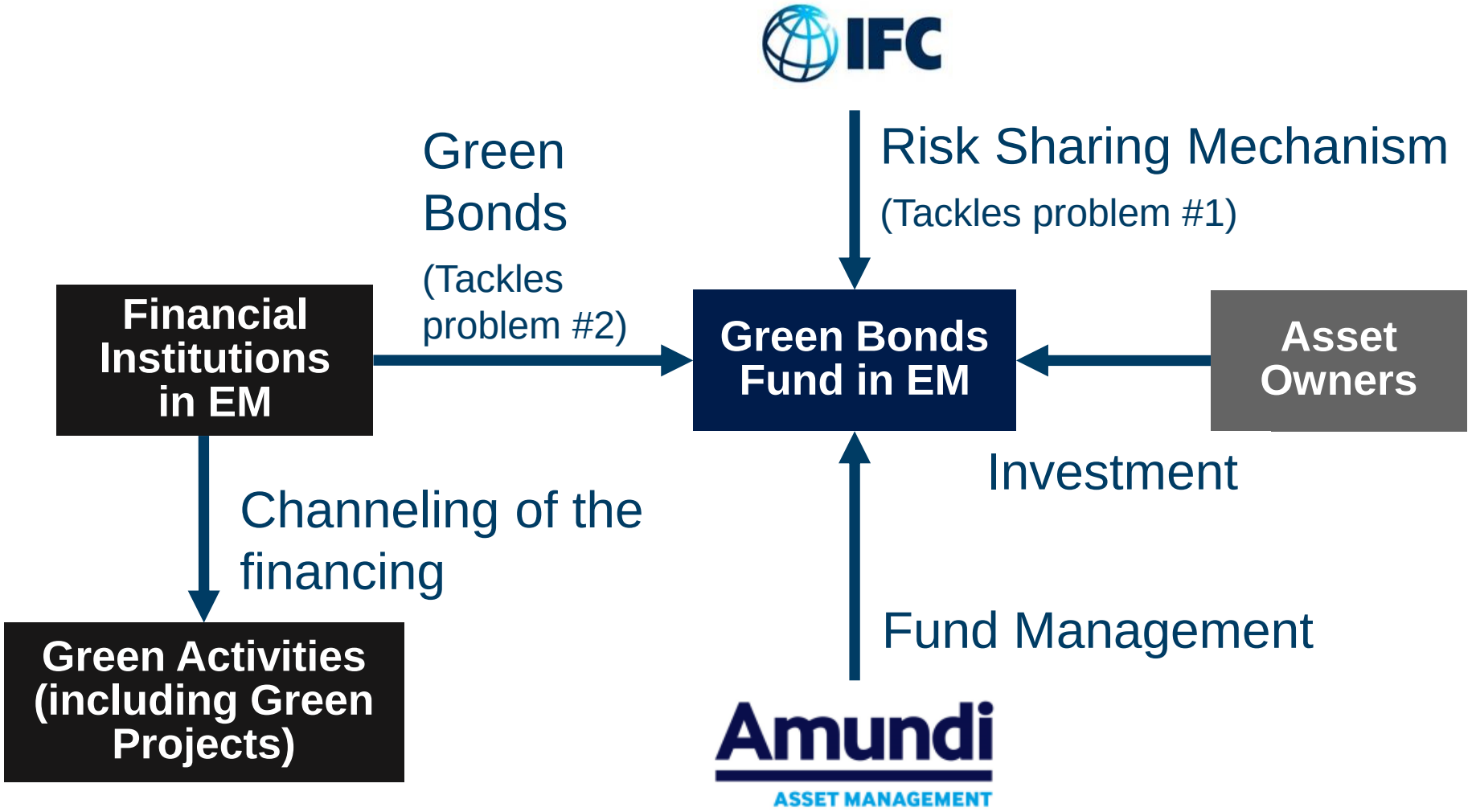
Green Infrastructures Financing Gap: Elegant Solution



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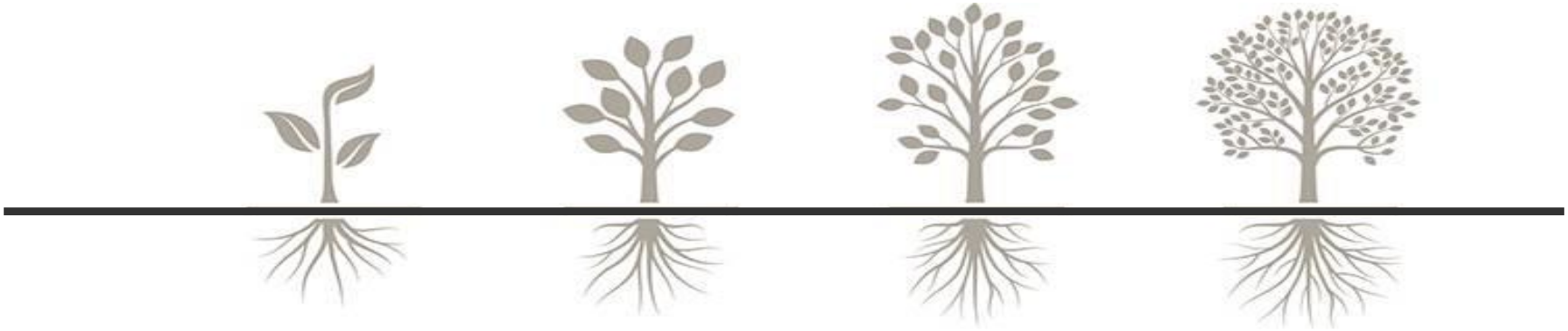
Green Infrastructures Financing Gap: Elegant Solution

- Deploying more than $2bn to support demand for emerging market green bonds
- Management of GCB strategy deploying extensive expertise in green bonds and Emerging Market Debt
- Disseminating green bond best practices in emerging markets



- Support the supply of green bonds in emerging markets
- Spread and enhance standards of the Green Bond Principles
- Provide technical support for training, measurement and reporting
- Provide a risk sharing mechanism

AP EGO's ESG Policy

Demanding Development Finance Institutions

IFC

European Bank for Reconstruction and Development

European Investment Bank

- Development focus with varying priorities.
- All aware of best practices in green bond issuances.
- Far reaching requirements originating from usual practices in project finance.

Amundi Expertise and Capabilities

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- Robust ESG Methodology at issuer level.
- Best practice capabilities in analyzing public market green bonds.
- Supportive of developing best impact reporting practices.

An ESG Framework resting on four pillars

ESG Charter

- Part of investment guidelines.
- Focus on green bond analysis.
- Including investor demands on sector/activity exclusion.

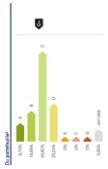
Scientific Committee

- Advisory body to the Fund Manager.
- ESG and green finance experts.
- Ensuring the best possible ESG practices of the Fund.

IFC International Finance Corporation WORLD BANK GROUP

IFC Investment Support Facility

- Supporting supply of green bonds.
- Training, education, and cost coverage for EM bankers.



Impact Reporting Focused

- Project level analysis.
- Based off international best practices.
- Supported by IFC's investment support facility.

Support since the launch

"We are thrilled by the IFC-Amundi partnership as it aims to accelerate the development of green bonds in emerging markets, which is vital for the transition towards the low carbon economy."

Philippe Desfosses, Chairman of ERAFP

"The IFC-Amundi initiative is especially interesting in that it seeks to provide access to green bonds in emerging markets, where the adjustments to climate change are especially challenging."

Adrian Orr, CEO New Zealand Superannuation Fund

"I am absolutely delighted with this innovative partnership aimed at mobilizing assets owners in developed markets to finance the transition towards the low carbon economy in emerging markets."

Christiana Figueres, Former executive Secretary of UNFCCC

"I am very enthusiastic with this innovative partnership between IFC and Amundi. It promises to be a game changer with a unique product that combines attractiveness for investors and impact in emerging markets."

Lord Stern, IG Patel Professor of Economics and Government at London School of Economics

High Recognition

From partnership inception to fund launch

Partnership launch

FINANCIAL TIMES

IFC invests $325m in green bond fund for emerging markets

Arm of World Bank to support environmentally friendly projects in developing markets

REUTERS

World Bank's IFC, Amundi to create $2 billion green bond fund

Fund closing

FINANCIAL TIMES

Green investing generates returns, not just a warm glow

Sustainability is now seen as a way of looking at often ignored externalities

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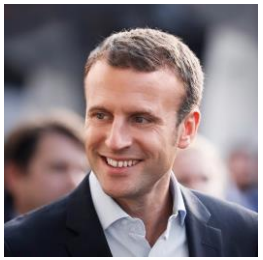
Amundi and World Bank close largest green bond fund at $1.4bn



G20 Report

Presented by **X. Musca,** former Head of the French Treasury and President Sarkozy Chief of Staff.

Making the case of the IFC deal being a case study of a new business model for developing banks

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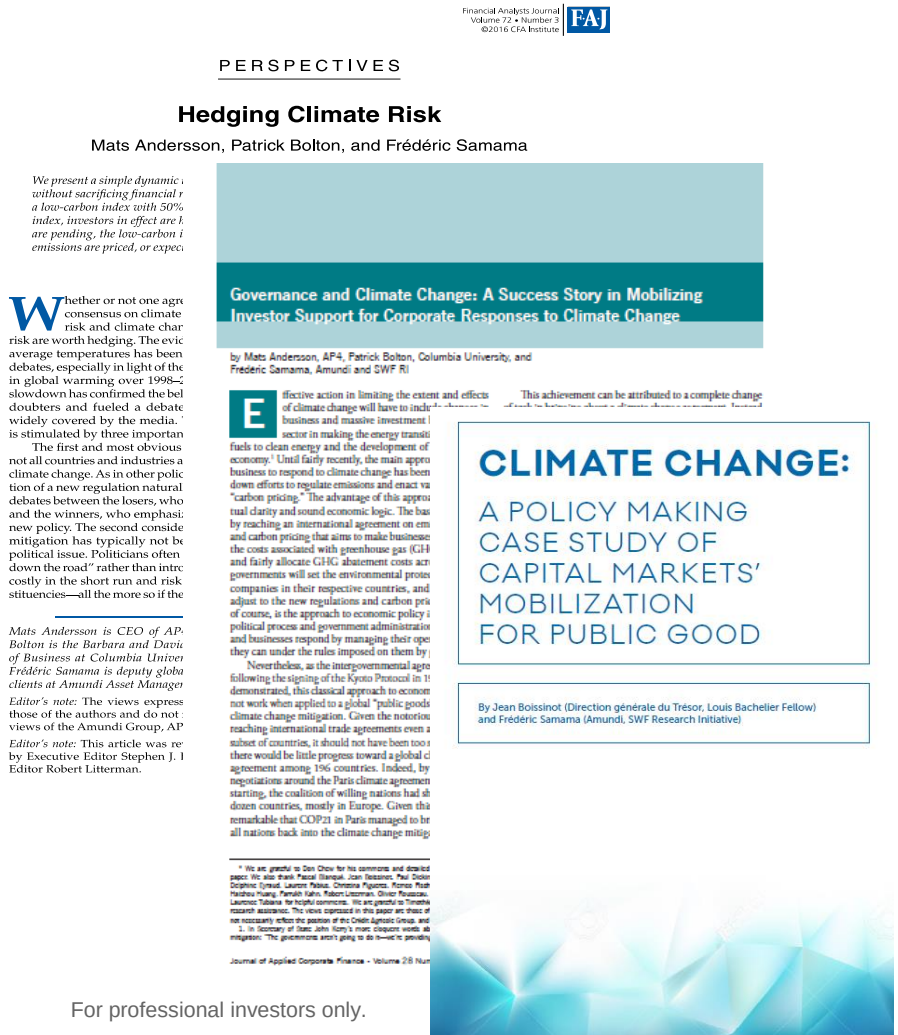
Amundi participating to thought leadership



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PERSPECTIVES

Hedging Climate Risk

Mats Andersson, Patrick Bolton, and Frédéric Samama

We present a simple dynamic
without sacrificing financial
a low-carbon index with 50%
index, investors in effect are
are pending, the low-carbon
emissions are priced, or expec

Whether or not one agr
consensus on climate
risk and climate char
risk are worth hedging. The evic
average temperatures has been
debates, especially in light of the
in global warming over 1998–2
slowdown has confirmed the bel
doubters and fueled a debate
widely covered by the media.
is stimulated by three importan
The first and most obvious
not all countries and industries a
climate change. As in other polic
tion of a new regulation natural
debates between the losers, who
and the winners, who emphasi
new policy. The second conside
mitigation has typically not be
political issue. Politicians often
down the road" rather than intro
costly in the short run and risk
stituencies—all the more so if the

Mats Andersson is CEO of AP
Bolton is the Barbara and Davi
of Business at Columbia Univer
Frédéric Samama is deputy globa
clients at Amundi Asset Manage

Editor's note: The views express
those of the authors and do not
views of the Amundi Group, AP

Editor's note: This article was re
by Executive Editor Stephen J.
Editor Robert Litterman.

Governance and Climate Change: A Success Story in Mobilizing Investor Support for Corporate Responses to Climate Change

by Mats Andersson, AP4, Patrick Bolton, Columbia University, and Frédéric Samama, Amundi and SWF RI

Effective action in limiting the extent and effects of climate change will have to incl
business and massive investment
sector in making the energy transiti
fuels to clean energy and the development of
economy.[1] Until fairly recently, the main appro
business to respond to climate change has been
down efforts to regulate emissions and enact va
"carbon pricing." The advantage of this approa
tual clarity and sound economic logic. The bas
by reaching an international agreement on em
and carbon pricing that aims to make businesse
the costs associated with greenhouse gas (GH
and fairly allocate GHG abatement costs acr
governments will set the environmental protes
companies in their respective countries, and
adjust to the new regulations and carbon pri
of course, is the approach to economic policy
political process and government administratio
and businesses respond by managing their ope
they can under the rules imposed on them by

This achievement can be attributed to a complete change

Nevertheless, as the intergovernmental agre
following the signing of the Kyoto Protocol in 1
demonstrated, this classical approach to econom
not work when applied to a global "public goods
climate change mitigation. Given the notorio
reaching international trade agreements even
subset of countries, it should not have been too
there would be little progress toward a global c
agreement among 196 countries. Indeed, by
negotiations around the Paris climate agreemen
starting, the coalition of willing nations had s
dozen countries, mostly in Europe. Given tha
remarkable that COP21 in Paris managed to br
all nations back into the climate change mitig

* We are grateful to Don Chow for his comments and detailed
papers. We also thank Pascal Blanqué, Jean Boissinot, Paul Dickin
Delphine Eyraud, Laurent Fabius, Christina Figueres, Romain Hoh
Haizhou Huang, Farrukh Kahn, Robert Litterman, Olivier Rousseau,
Laurence Tubiana for helpful comments. We are grateful to Timothé
research assistance. The views expressed in this paper are those o
not necessarily reflect the position of the Crédit Agricole Group, and
1. In Secretary of State John Kerry's more eloquent words, ab
mitigation: "The governments aren't going to do it—we're providing

Journal of Applied Corporate Finance • Volume 28 Nu

CLIMATE CHANGE:
A POLICY MAKING CASE STUDY OF CAPITAL MARKETS' MOBILIZATION FOR PUBLIC GOOD

By Jean Boissinot (Direction générale du Trésor, Louis Bachelier Fellow) and Frédéric Samama (Amundi, SWF Research Initiative)

ACADEMIC PAPERS WITH KEY ACTORS

Financial Analysts Journal (2016)

"Hedging climate risk"

Co-written with AP4 and Columbia University

Journal of Applied Corporate Finance (2016)

"Governance and Climate Change: a Sucess Story in Mobilizing Investor Support for Corporate responses to Climate Change "

Co-Written with AP4 and Columbia University

"Coping with Climate Crisis" Book (2018)

"Climate Change: A policymaking case study of capital markets' mobilization for public good "

Co-Written with Jean Boissinot (French Treasury)

For professional investors only.

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Portfolio Decarbonization Coalition

WHAT?	- **Commitment to align portfolios with a low carbon economy: $800bn** - Open platform with the aim of promoting environmentally friendly practices and sharing experiences which contribute to the goal of decarbonization
FOR WHOM?	- 32 institutional investors - **Representing more than $3.2trn AuM**
WHY?	- Help institutional investors deliver their fiduciary duty - Inspire businesses and investors to act on climate change

Portfolio Decarbonization Coalition

REDUCING & MANAGING CARBON RISK

RATES	EQUITY	RATES/EQUITY
Decarbonized Interest Rates Portfolios	Decarbonized Index Portfolios	Divestment strategies

Allianz, Amundi, AP4, APG, Australian Ethical Investment, CDPQ, Church of Sweden, Environment Agency Pension Fund, ERAFP, Fonds de Reserves des Retraites, KLP, Local Government Super, Mandatum, Mirova, NY Common Retirement Fund, Point Capital Management, Robeco SAM, Sonen capital, Storebrand, Toronto Atmospheric Fund, Unilever Pension Fund, University of Sydney, …

Source: Portfolio Decarbonization Website as of 24 April 2018.

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Conclusion

Investors have means to engage in the climate change battle:

- Is now perceived as a real risk for long-tem investors
- Financial innovation allows investors to handle such risks.

France is leading the pack:

- Political will
- Financial innovation
- Asset owners' mobilization
- Regulatory environment

Amundi plays a pivotal role in this movement:

- Mobilization in 2009 and part of its DNA
- Development of the first low carbon indexes (now being used by GPIF, CalSTRS, etc.)
- Selected by World Bank/IFC to launch the largest green bond fund
- Innovative partnerships to cover all asset classes
- Part of the public debate (PDC, published papers, etc.)

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Appendix

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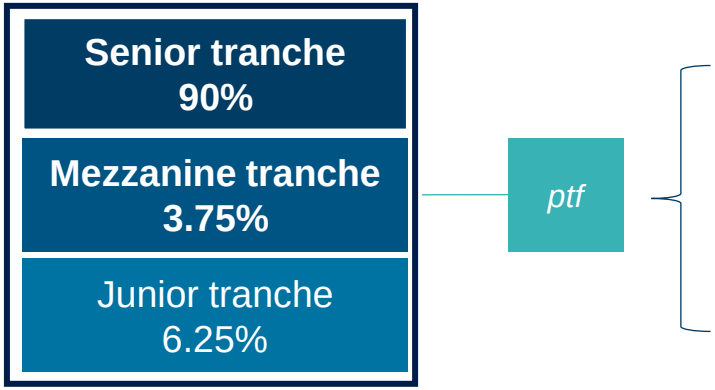
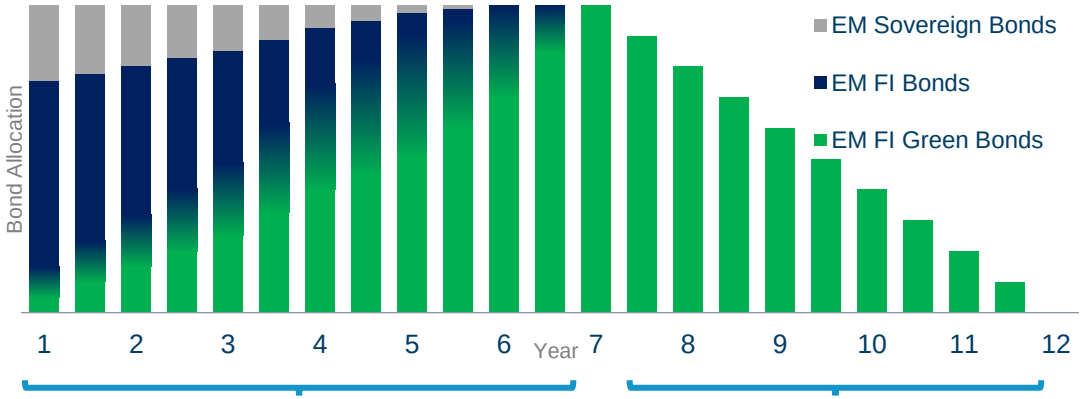
EM Green Bonds strategy

Financing the energy transition in Emerging Markets

Structure



Portfolio



Pooled vehicle

- Luxembourg Specialized Investment Fund (SIF)
- European AIF
- Shares to be listed
- 12yr legal maturity

Fin. features:

- EMD Hard Currency
- Portfolio target gross yield > [5.0%]
- Indicative rating: [BB+/BB]

Investment period

- From 100% EM bonds (with systematic ESG screening)
- To target 100% FI green bond(1)
- Capture yield premiums
- Finance the energy transition

Run-off period

- FI green bond portfolio matures
- Other bonds—if any—to be divested(2)
- Distributions of proceeds to investors

For professional investors only. (1)There is no assurance that the portfolio will reach the green bonds investment targets as indicated in the chart above. (2) Within a period of 6 months subject to normal market conditions.

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The “Low carbon” indices of the open-ended funds strategy do not have as an objective to exclude all companies emitting carbon but rather to reduce the representativeness of the latter compared to the composition of the parent index. Each strategy index will maintain a sectorial and geographic composition similar to its parent index. Their construction is realized in an objective of performance, tightly correlated to those of the parent indices. Hence, the deviation of geographic and sectorial weights of the strategy index compared to the parent index is limited to 2%.

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