Towards Paris: Necessary transitions, transformations and a role for risks

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Overview

- Climate change: the science and challenges
- Role of negotiations under the UNFCCC
- Necessary transitions and transformations for 2 °C
- Role of risks
Climate Change ongoing

“Warming unequivocal… human influence extremely likely the dominant cause”  (probability> 95%)

Source: IPCC, 2013
**IPCC 2012/14: Climate extremes**

**Key messages**
- A changing climate leads to changes in extreme weather and climate events
- There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes
WIDESPREAD OBSERVED IMPACTS
A CHANGING WORLD
Impacts of climate change

Confidence in attribution to climate change

Observed impacts attributed to climate change for

- Physical systems
  - Glaciers, snow, ice, and/or permafrost
  - Rivers, lakes, floods, and/or drought
  - Coastal erosion and/or sea level effects

- Biological systems
  - Terrestrial ecosystems
  - Wildfire
  - Marine ecosystems

- Human and managed systems
  - Food production
  - Livelihoods, health, and/or economics

Regional-scale impacts

Outlined symbols = Minor contribution of climate change
Filled symbols = Major contribution of climate change
Global warming: current and future

Abweichung der mittleren globalen Oberflächentemperatur (°C)

Historische Entwicklung

1900 1950 2000 2050 2100

IPCC AR5 430-480 ppm CO₂-Äq.-Bereich
IPCC SRES A1B
IPCC SRES A1FI
RCP 8,5
RCP 6,0
RCP 4,5
GEA
RCP 2,6

Austrian Panel on Climate Change (APCC) 2014
RISKS OF CLIMATE CHANGE INCREASE WITH CONTINUED HIGH EMISSIONS
Visions of the future that we are creating
IPCC’s 5 Reasons for Concern and the 2 degree target

Climate Summit 16 in Cancun, 2010: States agreed to limit global warming to less than 2 degrees Celsius compared to pre-industrial times based on science input (IPCC and others).
Moving to a 2 degree world
A big challenge

Emissions in Annex I countries to be reduced by 80-95% by 2050

World Bank, 2010
Business as usual: Green Growth
Bolstering efficiency
Efficiency
Relative decoupling

Jackson, 2009
Scale

„Big is beautiful“

‘I would say this is most environmentally friendly cruise ship to date. It is much more efficient than other similar ships. ... It dumps no sewage into the sea, reuses its waste water and consumes 25 percent less power than similar, but smaller, cruise liners.’ (Project engineer)
Absolute decoupling .... not happening
Absolute decoupling .... not happening
Climate negotiations process in a nutshell

• 1992: UN Framework Convention on Climate Change (UNFCCC)
  o established 1992: framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases (GHGs) to avoid “dangerous anthropogenic interference with the climate system.”
  o Entered into force 1994, now 196 parties.

• 1997: Kyoto Protocol 1997, entered into force 2005, Industrialized countries to reduce emissions by 5% from 1990 to average over 2008-12: successful!

• 2010: 2°C target agreed in Cancun
UNFCCC process in a nutshell

• 2011
  o 2\textsuperscript{nd} commitment period of Kyoto: less countries (18\% reduction to 1990, 15\% of global emissions) until 2020
  o Green Climate Fund (there are also other funds)
  o Mandate “to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties, to be complete by 2015, and enter into force in 2020’
  o 2012: Doha amendment on 2\textsuperscript{nd} commitment period
UNFCCC process in a nutshell

• 2013:
  o INDCs: Intended Nationally Determined Contributions
  o Establishment of Warsaw International Mechanism on Loss and Damage
  o Warsaw REDD+ Framework (deforestation and land degradation)

• 2014
  o ‘Lima Call for Climate Action’ confirms ambition to work towards a global climate deal in Paris at COP21
  o Notes 2 °C and 1.5 °C warming goals
Lima climate change talks reach global warming agreement

Deal would for first time commit all countries – including developing nations – to cutting emissions.

The plan, agreed at United Nations talks on Sunday, was hailed as an important first step towards a climate change deal due to be finalised in Paris next year. The proposals call on countries to reveal how they will cut carbon pollution, ideally by March next year.

“As a text it’s not perfect, but it includes the positions of the parties,” said Manuel Pulgar-Vidal, the Peruvian environment minister, who presided over the talks.

However, negotiators acknowledged they had put off the most difficult decisions for later.

And with 2014 on course to be the hottest year on record, campaigners warned the plan was far too weak to limit warming to the internationally agreed limit of 2°C above pre-industrial levels, or to protect poor countries from climate change.

“It’s definitely watered down from what we expected,” said Alden Meyer of the Union of Climate Change Communicators.
Complexity of negotiations

The diagram illustrates the Paris Climate Protocol and its components. It outlines how states, procedures, and processes are interconnected, highlighting the role of global civil society in the context of climate protection. The protocol includes principles such as the precautionary principle, the polluter pays principle, and the equality principle. It also details the commitment by parties to the UNFCCC, specifying targets and mechanisms for monitoring and compliance.

Key elements include:
- Parties to the UNFCCC commit to the protocol.
- General Part: commit to codify the 2°C guard rail.
- Special Part: commit to zero CO2 emissions by 2070 at the latest.
- Pledge & Review Process: targets up to 2030 and decarbonization roadmaps up to 2070.
- Science (IPCC): provides current scientific knowledge.
- Everyone (NGOs, civil society, citizen movements, individuals): are given access to justice.
- Pioneer clubs and networks: could be given preferential access.

The protocol also emphasizes technological transfer, financing, flexible mechanisms, adaptation, and dealing with loss and damage, ensuring transparency and participation through global civil society.
COP 21 Paris: on the table

- Mitigation
- Adaptation
- Funding
- Support for risks beyond adaptation (Loss and Damage)
Business as usual and pledges

INDCs

lower projected warming to 2.7°C: significant progress but still above 2°C

Climate Action Tracker Update

Johannes Gütschow, Louise Jeffery, Ryan Alexander
Potsdam Institute for Climate Impact Research

Bill Hare, Michiel Schaeffer, Marcia Rocha
Climate Analytics
Niklas Höhne, Hanna Fekete
NewClimate Institute
Pieter van Breevoort, Kornelis Blok
Ecofys

Summary

The UNFCCC set a deadline of October 1, 2015 for Intended Nationally Determined Contributions (INDCs) to be included in its synthesis document. While more INDCs may come in over the day, as of 11am 108 INDCs representing 135 countries have been registered with the UNFCCC, covering about 78% of global emissions.

The INDC process has led to a significant improvement in promised action compared to earlier pledges of action and informal announcements.

If fully implemented, the submitted INDCs for 2025 and 2030 are projected to lead to a warming of around 2.7°C by 2100 reflecting a 0.4°C improvement on the situation in December 2014, where only announcements for 2030 and pledges for 2020 were available.

Compared to the 3.6°C by 2100 warming that is projected to result from current policies the INDCs submitted lower warming by about 0.9°C.

There is still a large emissions gap in 2025 and, to stay below 2°C, the gap is 11-13 GtCO2e. For 1.5°C the 2025 gap is 14-16 GtCO2e and would therefore require significant improvement in the level of mitigation ambition.

With current INDCs, the emissions gap is set to grow rapidly towards 2030.

There is a major risk that if current INDCs are locked in for 2030 and not reviewed and strengthened every five years, starting in 2020, that achievement of the 1.5°C goal called for by all the most vulnerable countries may be locked out, and achievement of the 2°C goal fundamentally threatened.

Of the 19 INDCs rated by the CAT, covering about 71% of global emissions, 17 have not been rated as “sufficient.” Instead, we rated eight, which cover 56% of global emissions, “medium,” and eight, which cover 14% of global emissions as “inadequate.” Two are sufficient but cover only 0.4% of global emissions, and one is not rated due to insufficient information.

Based on the climate action promised under the INDCs it is now clear that governments at the Paris climate conference need to consider a formal acknowledgement that there is an insufficient level of mitigation ambition for 2025 and 2030 to limit warming below 2°C. A rapid review of the INDCs at the latest by 2020 for the post-2025 period, backed by continuous efforts before the entry into force of the Agreement is needed to catalyse action and ensure the Agreement has a running start.

Climate Action Tracker, October 1st 2015
IPCC suggests 2 °C possible

• “It does not cost the world to save the planet”

• Mitigation scenarios for a good chance of 2°C by 2100 lead to losses in annualized reduction of consumption growth by about 0.06 percentage points over the century relative to annualized consumption growth in the baseline that is between 1.6% and 3% per year.

• Critical assumptions: Carbon capture and storage, biomass
Road to Paris and beyond

LIMA
- Criteria for national commitments (INDC) agreed
- Roadmap to Paris agreed
- Elements of the “Paris Protocol” agreed and formal negotiations started
- Green Climate Fund filled with 15 bn US$

2014 2015 2020 2025 2030 2035 2040 2045 2050

SHORT-TERM ACTION UNTIL 2020
- Enhanced Pre-2020 mitigation efforts
- Start long-term phase out of coal, oil and gas in a just transition
- Feed-in tariff and priority access for renewable energy
- Zero deforestation

Financing
- Stop financing of coal through development banks and subsidies
- 100 bn US$ per year public/private
- Innovative sources (levy on bunker fuels, financial transaction tax...)

Continuous support for adaptation/mitigation in poor countries

2014 © GREENPEACE
Transition & Transformation: a multi-objective, multi-actor decision problem

- Enhancing energy access
- Reducing indoor air pollution
- Safeguarding energy security
- Managing disaster risk
Need for change
1. Lack of energy access
Need for change

2. Ill Health

- Almost 4 million people die prematurely every year due to exposure to household pollution due to inefficient combustion of solid fuels.
- The deaths from household pollution and drudgery of fuel collection falls disproportionately on women and children.
- Perpetuates poverty, gender and other social disparities.

Source: Pachauri et al. 2012, Chapter 19 GEA
Need for change
3. Lack of energy security

**Figure TS-5** | Number of people in countries that are dependent on imported oil, gas and coal. Source: data from Chapter 5.
Alternative: Transformative pathways

- Stabilizing global climate change to 2°C above pre-industrial levels in the 21st century,
- Enhanced energy security by diversification and resilience of energy supply (particularly the dependence on imported oil),
- Eliminating household and ambient air pollution, and
- Universal access to modern energy services by 2030.

Global Energy Assessment, 2012
Transformative pathways

The GEA makes the case that energy system transformation requires an iterative and dynamic transformation of the policy and regulatory landscape, thereby fostering a buildup of skills and institutions that encourage innovation to thrive, create conditions for business to invest, and generate new jobs and livelihood opportunities.

A major finding of the GEA is that some energy options provide multiple benefits. This is particularly true of energy efficiency, renewables, and the coproduction of synthetic transportation fuels, cooking fuels, and electricity with co-gasification of coal and biomass with CCS, which offer advantages in terms of supporting all of the goals related to economic growth, jobs, energy security, local and regional environmental benefits, health, and climate change mitigation. All these advantages imply the creation of value in terms of sustainability. This value should be incorporated into the evaluation of these and other measures and in creating incentives for their use.

One implication of this is that nations and corporations can invest in efficiency and renewable energy for the reasons that are important to them, not just because of a global concern about, for example, climate change mitigation or energy security. But incentives for individual actors to invest in options with large societal values must be strong and effective.

The GEA explored 60 possible transformation pathways and found that 41 of them satisfy all the GEA goals simultaneously for the same level of economic development and demographic changes, including three groups of illustrative pathways that represent alternative evolutions of the energy system toward sustainable futures.

The pathways imply radically changed ways in which humanity uses energy, ranging from much more energy-efficient houses, mobility, products, and industrial processes to a different mix of energy supply – with a much larger proportion of renewable energy and fossil advanced fossil fuel technologies (see Figure SPM-3).

Figure SPM-3. Development of primary energy to 2008 and in the three illustrative GEA pathways for the years 2030 and 2050. Source: based on Figures TS-24 and 17.13, Chapter 17. For further details of the GEA pathways see the interactive web-based GEA scenario database hosted by IIASA: www.iiasa.ac.at/web-apps/ene/geadb.

The pathways encompass eleven world regions, grouped into five GEA regions and energy sectors, including supply and demand, with a full range of associated social, economic, environmental and technological developments.

GEA, 2012
Synergistic approaches with large cost savings

Fig. 4 Costs of achieving societal objectives for energy sustainability under different policy prioritization frameworks. The upper panel shows global policy costs between 2010 and 2030. This represents the net financial requirements (energy-system and pollution-control investments, variable, and operations and maintenance costs) over and above baseline energy-system development, which is itself estimated at 2.1% of globally-aggregated GDP. Triangular schematics above the bars summarize the performance of scenarios that achieve ‘stringent’ fulfillment only for the objective(s) targeted under the corresponding policy frameworks (axis values normalized from 0 to 1 based on the full range of scenario ensemble outcomes; CC = Climate Change, ES = Energy Security, PH = Air Pollution and Health). [Adapted from Fig. 1 in McCollum et al. (2011)]. The lower panel shows the portfolio of expenditures (= investments + O&M; global, by sector) required to achieve the objectives at their most stringent fulfillment levels under each policy prioritization framework. Energy efficiency refers to efficiency and conservation measures beyond those in a no-policy baseline scenario.

McCollum et al. (2013)
2 degree scenarios

Enhanced energy security for nations and regions is another key element of a sustainable future. Reduced global interdependence via reduced import/export balances, and increased diversity and resilience of energy supply have been adopted as key energy-related metrics. The targets for these goals were assessed ex-post through the GEA pathways analysis (Chapter 17), identifying the need for energy efficiency improvements and deployment of renewables to increase the share of domestic (national or regional) supply in primary energy by a factor of two and thus significantly decrease import dependency (by 2050). At the same time, the share of oil in global energy trade is reduced from the present 75% to below 40% and no other fuel assumes a similarly dominant position in the future.

The climate change mitigation goal is to contain the global mean temperature increase to less than 2°C above the preindustrial level, with a success probability of at least 50%. This implies global CO$_2$ emissions reductions from energy and industry to 30–70% of 2000 levels by 2050, and approaching almost zero or net negative emissions in the second half of the century (Figure SPM-2).

Health goals relating to energy systems include controlling household and ambient air pollution. Emissions reductions through the use of advanced fuels and end-use technologies (such as low-emissions biomass cookstoves) for household cooking and heating can significantly reduce human morbidity and mortality due to exposure to household air pollution, as well as help reduce ambient pollution. In the GEA pathways, this is assumed to occur for the vast majority of the world’s households by 2030. Similarly, a majority of the world’s population is also expected to meet the World Health Organization’s (WHO) air quality guidelines (annual PM$_{2.5}$ concentration < 10 µg/m$^3$ by 2030), while remaining populations are expected to stay well within the WHO Tier I-III levels (15–35 µg/m$^3$ by 2030). In addition, there needs to be a major expansion of occupational health legislation and enforcement in the energy sector.

Linkages between the energy system and the environment are at multiple levels and scales – from local to global. While the local environmental and ecological consequences of resource extraction, processing and energy conversion have been long recognized, attention is increasingly turning towards the growing evidence that humanity has reached a phase when anthropogenic pressures on Earth systems – the climate, oceans, fresh water, and the biosphere – risk irreversible disruption to biophysical processes on the planetary scale. The risk is that systems on Earth may then...

*Figure SPM-2. Development of global CO$_2$ emissions from energy and industrial sources to limit temperature change to below 2°C (with a success probability of >50%). Shown is that the emissions need to peak by around 2020 (or earlier) and decline toward zero during the following four to five decades. The later the peak occurs, the steeper the decline needs to be and higher the net “negative” emissions. The latter can be achieved through in the energy system through carbon dioxide capture and storage in conjunction with the use of sustainable biomass. Source: Chapter 17. For further details of the GEA pathways see the interactive web-based GEA scenario database hosted by IIASA: www.iiasa.ac.at/web-apps/ene/geadb.*

IIASA, 2012
Austria: possible, but...
Reality check: Austria

Kapitel 6: Transformationspfade

AAR14

3

% / Jahr mit einer Halbierung der globalen Emissionen von $CO_2$-Äquivalenten bis 2050 vereinbar sei. Dies würde für Industrieländer erfordern, ihre Gesamtemissionen um 80–95 % im Vergleich zu 1990 zu reduzieren (siehe etwa IPCC, 2007).

Um diese Zielvorgaben alleine durch Energieeffizienzmaßnahmen zu erreichen, müsste die Energieeffizienz in Österreich jährlich um mehr als 3 % steigen. Bei stärkerem nationalem Wirtschaftswachstum im Bereich von 2 % / Jahr wären dann Eeffizienzsteigerungen von mehr als 5 % / Jahr nötig. Alternativ könnte allerdings ein Teil dieses Zieles auch durch die Dekarbonisierung der Primärenergie, etwa durch den Ausbau erneuerbarer Energien, erreicht werden. Insgesamt würden solche Annahmen von einer Verbesserung der Energieeffizienz im Bereich eines Faktors von 10 ausgehen, was selbst OptimistInnen als unrealistisch einschätzen (Hinterberger, 2009).

Insgesamt ist die Energieintensität der Österreichischen Wirtschaft in den vergangenen 20 Jahren um weniger als 1 % jährlich gesunken, wobei der Großteil dieses Rückgangs auf strukturelle Veränderungen zurückzuführen ist (siehe Abbildung 6.4), während das BIP im selben Zeitraum um mehr als die doppelte Rate wuchs. Langfristig sank die $CO_2$-Intensität der Primärenergie (T onnen $CO_2$ / Terrajoule) im Zeitraum 1990 bis 2011 nur um etwa 0,4 % / Jahr, ebenso wenn nur die Periode 2000 bis 2011 berücksichtigt wird. Erst seit 2004 ist durch den Ausbau der regenerativen Energieträger eine Beschleunigung der Dekarbonisierung (auf $-1,2 \% / Jahr für den Zeitraum 2004 bis 2011) zu beobachten. Insgesamt resultierte die Entwicklung seit 1990 aber in einem netto Wachstum des Energieverbrauchs und der damit verbundenen THG-Emisionen (Sorrell und Dimitriopolous, 2008; Madlener und Al-.1990

Abbildung 6.3 Trajectories of GDP vs. carbon intensity 1990-2011 for Austria (upper panel) and the UK (lower panel); Source: modified from Mechler et al. (2010)

Achieved with hot air

APCC 2014 after Mechler et al., 2010
Funding
Goal is USD 100 billion by 2020

Mitigation 77%
Adaptation: 16%
Joint 7%

Includes concessional loans and private funding
Transitions and transformations
Dynamics and multiple scales

In this context, the freedom of today's generation ends where the freedom of future generations begins. The transformative narratives and laboratories mentioned in this section do not develop in isolation from each other, but are characterized by dynamic polycentric processes. The diagram shows how individual phenomena mutually reinforce each other and in turn generate new dynamics and centres of transformation at different levels by way of spill-over effects. Three movements – divestment, transition towns and boycotts – are taken up as examples. Each is represented by a ball. The movements can pass through different actor levels in different countries, triggering or boosting new processes. As a result of a compression of social movements – the formation of a world-citizen movement by individuals and alliances – the balls are played into the field of the upper actor level of the UNFCCC. There they can open up scope for taking action and generate fresh ideas, and this can in turn have a favourable effect on other levels. This also illustrates another fundamental thought: an individual cannot exercise this influence, but it cannot come about without the individual’s contribution in civil society either. In the same way, stagnating negotiating processes at the upper level cannot serve as a system confirmation or as an argumentation basis for restraint practised individually by private individuals, companies and countries.

Source: WBGU
Big emittters

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. Chevron, USA</td>
<td>423</td>
<td>51,096</td>
<td>3.52 %</td>
</tr>
<tr>
<td>2. ExxonMobil, USA</td>
<td>655</td>
<td>46,672</td>
<td>3.22 %</td>
</tr>
<tr>
<td>3. Saudi Aramco, Saudi Arabia</td>
<td>1,550</td>
<td>46,033</td>
<td>3.17 %</td>
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<tr>
<td>4. BP, UK</td>
<td>554</td>
<td>35,837</td>
<td>2.47 %</td>
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<tr>
<td>5. Gazprom, Russian Federation</td>
<td>1,371</td>
<td>32,136</td>
<td>2.22 %</td>
</tr>
<tr>
<td>6. Royal Dutch/Shell, Netherlands</td>
<td>478</td>
<td>30,751</td>
<td>2.12 %</td>
</tr>
<tr>
<td>7. National Iranian Oil Company</td>
<td>867</td>
<td>29,084</td>
<td>2.01 %</td>
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<tr>
<td>8. Pemex, Mexico</td>
<td>602</td>
<td>20,025</td>
<td>1.38 %</td>
</tr>
<tr>
<td>9. ConocoPhillips, USA</td>
<td>359</td>
<td>16,866</td>
<td>1.16 %</td>
</tr>
<tr>
<td>10. Petroleos de Venezuela</td>
<td>485</td>
<td>16,157</td>
<td>1.11 %</td>
</tr>
<tr>
<td>11. Coal India</td>
<td>830</td>
<td>15,493</td>
<td>1.07 %</td>
</tr>
<tr>
<td>12. Peabody Energy, USA</td>
<td>519</td>
<td>12,432</td>
<td>0.86 %</td>
</tr>
<tr>
<td>13. Total, France</td>
<td>398</td>
<td>11,911</td>
<td>0.82 %</td>
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<tr>
<td>14. PetroChina, China</td>
<td>614</td>
<td>10,564</td>
<td>0.73 %</td>
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<tr>
<td>15. Kuwait Petroleum Corp.</td>
<td>323</td>
<td>10,503</td>
<td>0.73 %</td>
</tr>
<tr>
<td>16. Abu Dhabi NOC, UAE</td>
<td>387</td>
<td>9,672</td>
<td>0.67 %</td>
</tr>
<tr>
<td>17. Sonatrach, Algeria</td>
<td>386</td>
<td>9,263</td>
<td>0.64 %</td>
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<tr>
<td>18. Consol Energy, Inc., USA</td>
<td>160</td>
<td>9,096</td>
<td>0.63 %</td>
</tr>
<tr>
<td>19. BHP-Billiton, Australia</td>
<td>320</td>
<td>7,606</td>
<td>0.52 %</td>
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<tr>
<td>20. Anglo American, United Kingdom</td>
<td>242</td>
<td>7,242</td>
<td>0.50 %</td>
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<tr>
<td>Top 20 IOCs &amp; SOEs</td>
<td>11,523</td>
<td>428,439</td>
<td>29.54 %</td>
</tr>
</tbody>
</table>

Heede, 2014
Transformative Alliances: Carbon divestment campaign

Companies' liquidity will be considerable. Development banks: The influence of development banks is also very large. For example, if the KfW were to follow the announcements of the World Bank and stop issuing loans for coal-fired power plants, this would lead to changes in the development pathways and, in the long term, in the energy market.

The range of possible actors shows that the divestment movement can be encouraged not only by groups or individuals in society, but also at the institutional level. This inclusiveness also constitutes part of this movement's transformative potential; individual people can decide against rules that appear to be set in stone and promote the transformation to a low-carbon society by participating in a global divestment movement.

Examples

In the USA there have been divestment movements targeting, for example, the tobacco industry, the arms industry, and against the apartheid system in South Africa. The divestment movement against investment in fossil fuels has already developed a dynamic of its own. For example, a growing student movement has formed in the USA which is putting pressure on the universities to withdraw their capital from fossil-fuel companies. Several universities, including Stanford, have announced divestment measures. The administration of Harvard University has also come under pressure from continuing student protests to divest its ‘carbon investments’ (totalling about US$33 billion; Goldenberg, 2014). In Berkeley and at other campuses of the University of California a majority of students have voted against investing in the shares of fossil-fuel companies.

64 professors and scholars, as well as over 800 students, alumni and employees of the University of Oxford have also signed a petition and an open letter calling on the university council to show leadership and responsibility in the societal discourse on climate change by divesting from fossil fuels (Oxford Academics for Fossil Fuel Divestment, 2014).

Similarly, several US cities, including San Francisco and Seattle, have announced their intention to divest (Greene and Kammen, 2014). In Norway an evaluation is currently ongoing to decide whether the investments of the Government Pension Fund (€800 billion), also referred to as the state oil fund should be withdrawn from fossil-fuel companies. The largest holdings include BP and Royal Dutch Shell. Furthermore, Pope Francis has received an open letter from various Christian groups appealing to the Catholic Church to stop investing its money in the fossil-fuel sector (Readfearn, 2014). The World Council of Churches, with a membership of 345 Christian churches in 140 countries, has announced that it will no longer be investing in fossil-fuel companies (WCC, 2014). Through the internet, too, a ‘multiplier effect’ has already developed in the divestment movement (Fossil Free, 2014a). The platform for divestment movements, gofossilfree.org, coherently summarizes the moral basis for divestment: “It’s wrong to profit from wrecking the planet” (Fossil Free, 2014).

Figure

Global divestment movements: selection of announced or implemented self-commitments to date to divest from the 200 largest fossil-fuel companies (as of July 2014).

Source: WBGU, based on data from Fossil Free (2014a)

WBGU, 2014
DIVESTMENT COMMITMENTS

OVERVIEW

$2.6 TRILLION
APPROX. VALUE OF INSTITUTIONS DIVESTED

453
INSTITUTIONS DIVESTING

WHAT KINDS OF INSTITUTIONS ARE DIVESTING?

- Faith-based Groups — 29%
- Foundations — 26%
- Pension Funds — 13%
- Governmental Organisations — 12%
- Colleges, Universities and Schools — 9%
- NGOs — 7%
- For-Profit Corporations — 2%
- Health — 1%
- Other — 0%

NOTABLE DIVESTMENT COMMITMENTS
Dealing with risks “beyond adaptation”

- Establishment of the “Warsaw international mechanism for loss and damage:” to deal with and provide support for residual climate-related damages after adaptation

- Contested terrain
  - ‘Southern countries’ at risk (such as AOSIS countries) demand climate justice
  - OECD negotiators willing to support good risk management, but liability and compensation considered red lines
Layering risk management

Mechler et al., 2014

Low frequency / high impact events

500 year

Limits to Adaptation

High risk layer

Loss&Damage

Extreme losses
Insurers are reluctant to cover risks; public and donor post-disaster assistance necessary

Medium to extreme losses
Risk financing may be the most appropriate response if risk reduction is not cost effective

Low to medium losses
Risk reduction is frequently the most cost-effective response

Adaptation

Finance

High frequency / low impact events
The disaster burden is real

Can disaster risk be reduced?

Major diseases. An average of

ties and in reducing specific risk have been significantly

Further, capacities for risk assessment and identification,

in developing institutions, policies and legislation for disas-

tering the underlying drivers of risk.

ippines is one of social development.

3.3

3.5

Level of progress [1 to 5]

1 (low implications) to 100 (severe implications)

Index = composite index, ranging from

Implications for Capital Stock and Gross Savings

Lower middle

Higher middle

Low

Average Annual Loss (AAL) [2005 million US$]

- Multi-Hazard:
  - Average Annual Loss (AAL) [million US$]
  - Earthquake, flood, cyclone wind, storm surge and tsunami

Global disaster risk today

- Damages, rather than managing
  - Which seeks to reduce existing

- Extensive mortality, 1990-2013

- Losses from Disasters remain high

- Future losses represent a substantial

- A large amount of damage occurs in small disaster events;

- Disaster risk can be reduced and it

- Good financial sense.

- What continues to drive disaster risk?

- How much are disasters costing us?

- In low and middle-income coun-

- Accounts for 10% of

- 20,000

- 30,000

- 50,000

- GDP and losses and therefore higher levels of uncertainty

- 10%

- 20%

- 40%

- 80%

- To a 1-in-100-year loss event.

- GDP and losses and therefore higher levels of uncertainty

- 10%

- 20%

- 40%

- 80%

- To a 1-in-100-year loss event.

- GDP and losses and therefore higher levels of uncertainty

- 10%

- 20%

- 40%

- 80%

- To a 1-in-100-year loss event.
Distributional justice

- Compensating all countries for loss and damage beyond their coping capacity
- ~ USD 10 billion annually
- Increasing over time
- Signal for mitigation challenge

Disaster risk stress testing for 100 year events

IIASA, 2015
Conclusions

- 2°C as guardrail widely accepted
- Business as usual: not enough
- Voluntary agreements-pledges: not enough
- Transitions and transformation needed
- Agency across scales required and happening
- Role of risk to be acknowledged: risk in the balance sheets of companies and countries
IPCC, 2014: Fifth Assessment Report