

OVERVIEW OF SCIENCE INPUT FOR THE STANDING COMMITTEE ON FINANCE (SCF) CALL FOR EVIDENCE

The input below is based on IPCC reports and other relevant recent literature in response to the call for evidence on the information and data for the preparation of the 2020 Report on the determination of the needs of developing country Parties to implementing the Convention and Paris Agreement.

Financing the transition-mitigation

- Additional energy system investments between 2016 and 2050 under 1.5°C pathways amount to around 830 billion USD₂₀₁₀ (with a range of 150-1700 billion USD) per year. For comparison, global energy-system investments in one year (2016) are estimated at approximately 1.7 trillion USD₂₀₁₀ (Source: IPCC Special Report on Global warming of 1.5°C, SR1.5).
- Findings suggest a major shift in investment patterns and entail a financial system effectively aligned with mitigation challenges away from fossil fuels (down by about 300 billion 2010 USD per year over the 2016-2030 period) to energy efficiency and renewable energy (up around 350 billion per year 2010 USD, compare Fig. 2.27 SR1.5).
- Current NDCs will likely not trigger the scale of investments needed to reach the Paris LTTG, and to do so, low-carbon energy system investments need to overtake fossil-fuel investments in the coming decade¹.
- Total energy-related investments increase by about 12% in 1.5°C pathways relative to 2°C pathways, with strong regional disparity – e.g. increasing by about 30% in developing Asia².

Beyond the transition – a net-zero energy system

- Investment needs to achieve 1.5°C are highest over the near-term until net-zero CO₂ emissions are reached (IPCC SR1.5). After net-zero CO₂, however, a climate neutral energy system does not cost significantly more or can even be cheaper than an energy system based on current policy projections³. Long-term (end of century) costs then depend on the amount of CO₂ removal that is required as a result of insufficient near-term emissions reductions.
- Achieving the Paris Agreement goals will therefore require stringent near-term shifts in investments and financial flows that will have substantial long-term benefits.
- Substantial shifts in investments on the country level today are required to avoid long-term infrastructure lock-ins and stranded assets⁴.

Adaptation costs – substantial support for the most vulnerable required

- Given the complex and multi-faceted nature of adaptation, estimates of total adaptation costs are very difficult to compile. The scientific literature therefore does not include comprehensive estimates of all total adaptation costs, but rather sectoral estimates.
- **The investments needs in individual sectoral adaptation are comparable in order of magnitude to the mitigation costs of achieving 1.5°C.** The IPCC Special Report on the Oceans and Cryosphere (SROCC) estimates that the costs for coastal protection alone can “amount

1 McCollum, David L., et al. "Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable

2 Zhou, Wenji, et al. "Decarbonization pathways and energy investment needs for developing Asia in line with 'well below' 2° C." *Climate Policy* (2020): 1-12.

3 Rogelj, J. et al. A new scenario logic for the Paris Agreement long-term temperature goal. *Nature* 2019, 0–1 (2019).

4 Steckel, J. C., Hilaire, J., Jakob, M. & Edenhofer, O. Coal and carbonization in sub-Saharan Africa. *Nat. Clim. Chang.* (2019). doi:10.1038/s41558-019-0649-8

to investments needs on the order of tens to several hundreds of billions of US\$ per year” during the 21st century. Over the full 21st century, these costs are comparable to the mitigation costs under a 1.5°C scenario. The SROCC further finds that “rural and poorer areas may be challenged to afford such investments with relative annual costs for some small island states amounting to several percent of GDP”.

- **Limits to economically efficient adaptation options may be exceeded above 1.5°C.** According to the IPCC SROCC, ecosystem-based adaptation measures are often the most cost-efficient options (including coral reef or wetland conservation and regrow). However, the efficiency of these options is detrimentally affected above 1.5°C and even more so above 2°C. If those limits to adaptations are transgressed, much more costly alternatives, such as hard adaptation measures, need to be deployed, leading to substantially increased adaptation investment needs.