

# Energy-water- land use nexus in Central Asia

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# Energy-water-land use nexus in Central Asia



# Project Concept

The consortium led by the OECD in co-operation with UNECE, EBRD with FAO and SIC ICWC proposes a new four-year regional project for Central Asia. The project aims to operationalise the energy-water-land nexus approach, and support the countries of Central Asia with robust economic and financial analytical work to identify nexus opportunities and demonstrate the business case for co-operation around nexus issues at the regional and national level.

Funded by Germany's International Climate Initiative (IKI) from the German Federal Ministry for Environment, the project will be prepared during Q3/4 2021. During this period, the consortium will determine national and regional priorities and scope work packages for future implementation. The project consortium will work with key stakeholders in each country, development partners, and existing and planned initiatives relevant to the nexus in Central Asia. It will also aim to contribute to the 'Green Central Asia' initiative launched by Germany in 2020.

This document provides key background to the project and proposed action areas to which feedback from the Central Asian countries and development partners would be welcome.

## Central Asia at a glance



Energy, water and food security has been a key factor driving inter-state relations among Central Asian countries since independence.



Climate change is emerging as a critical risk for national and regional security in Central Asia, posing additional challenges to those socioeconomic and environmental issues around water, energy and land use.



Estimated population increase in Central Asia from 75.6 million in 2021 to 100 million in 2050, coupled with economic diversification will add pressure on the region's water, energy and land resources.



Central Asian countries are increasingly developing and implementing national and sectoral policies to address the risks associated with water, energy and food security as well as climate change.

## Regional co-operation for Central Asia's security in a changing climate

**Energy, water and food security has been a key factor that drives inter-state relations among Central Asian countries since their independence in the early 1990s.**

During the Soviet Union era, centrally coordinated mechanisms had facilitated the use of transboundary water in the Aral Sea basin for hydropower and agriculture. Yet, an externality of this mechanism was environmental degradation in the basin and sub-optimal management of water. Since independence, this centralised governance system turned into a challenge of transboundary management of water and energy resources among countries that have varying resource endowments, and geopolitical and economic interests.

**There has been continuous and constructive development in co-operation among the countries over resource management,**

including the roles played by institutions such as the International Fund for saving the Aral Sea and the Interstate Coordination Water Commission. Pressure on the region's water, energy and land resources is however likely to further increase in the coming decades, as populations grow, urbanisation advances, and economies diversify into manufacturing, processing and other industries. The region's population, for example, is likely to increase by over 30% from 75.6 million in 2021 to 100 million in 2050<sup>1</sup>. These changes will add further demand for natural resources.



**Climate change is emerging as a critical risk for national and regional security in Central Asia**, posing additional challenges to the socioeconomic and environmental issues around water, energy and land use in the region. The negative impacts of climate change are already manifesting to varying extents. Climate-related hazards in the region include slow-onset changes including glacial retreat<sup>2</sup> and desertification<sup>3</sup>, and extreme events such as floods<sup>4</sup> and droughts<sup>5</sup>. Floods, for instance, already affect nearly a million people in the region every year and cause economic losses of USD 4.7 billion<sup>6</sup>. Climate change is likely to amplify these impacts over the years to come. Increasing rates of glacial melt in the Tien Shan and Pamir mountains could lead to greater river runoff in the short term while decreasing water availability in the medium to long term. Climate change is projected to increase precipitation in the northern areas of Central Asia and decrease it in the south, which may widen existing economic disparities within the region<sup>7</sup>.

**Central Asian countries are increasingly developing and implementing national and sectoral policies to address the risks associated with climate change, and energy, water and land use management<sup>8</sup>.**

In addition to national funding, billions of development finance have also been committed and disbursed to support the development of infrastructure, policies, institutions, capacities and information. In Central Asia, the scope of climate action spans wide areas from hydro and non-hydro renewable energy, resource efficiency, land-use management, robust water allocation regimes, climate-smart agriculture and pasture management. While these measures and funding are driving national and regional climate action in Central Asia, some of the thematic and sectoral actions may also heighten regional tension if left uncoordinated.

### DID YOU KNOW?

Both governments and development partners have invested in climate action in energy, water, agriculture and forestry sectors across the region over the years. OECD DAC members, multilateral development banks and climate funds have committed USD2.75billion (343.2million per year on average) to support climate action in these sectors in Central Asia over the period 2013-2019. (See also <https://oe.cd/CRDF>).



## The nexus approach: a generator of economic, social and ecological benefits

**Pursuing regional resource security and socio-economic development in the face of climate risks in Central Asia requires coherent management of energy, water, and land resources throughout the region.** Studies suggest that transboundary co-operation in water resource management in the Syr Darya River Basin, for example, can generate large regional economic benefits. On the contrary, a lack of such co-operation could leave the riparian countries more exposed to external shocks, such as disasters, global economic crisis and disruptions in supply chains<sup>9</sup>.

**The nexus between energy, water and land use has been attracting attention of policy makers, development practitioners and academia in Central Asia as an approach to facilitate regional and cross-sectoral co-operation.** Adopting a 'nexus approach' allows governments to move beyond traditional sectoral thinking, and simultaneously achieve the policy objectives for energy, water, food and environmental security. A number of initiatives on the nexus have been undertaken in Central Asia, including those by ADB, the European Union, FAO, Finland, IFAD, SDC, UNECE, USAID, OSCE and the World Bank in collaboration with Central Asian governments and regional institutions. Tools to support application of the nexus approach have also been developed for Central Asia and beyond. They include the Transboundary Basin Nexus Assessment methodology<sup>10</sup>, the Water-Hydropower Agriculture Tool for Investments and Financing (WHAT-IF)<sup>11</sup> and the Basin Economic Allocation Model<sup>12</sup>, to just name a few.



**Benefits of greater regional co-operation within Central Asia for water, energy and land resource management are becoming evident. However, further work is still needed on robust economic and financial assessments to understand and communicate the benefits.** Multiple studies project that greater regional co-operation in the energy sector could have brought an additional benefit of at least USD 0.5 billion<sup>13</sup> to 6.4 billion<sup>14</sup> per year to Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. Another estimate shows an annual loss of USD 4.5 billion (or 1.6% of the regional GDP)<sup>15</sup> due to the lack of co-operation. This figure can be a significant underestimation, given its scope being only agricultural losses, inefficient electricity trade and a missed opportunity to access international finance. Such quantification still faces a number of technical challenges. Central Asian governments need further analytical work on robust economic and financial assessments to fully quantify and realise the benefits of regional co-operation through adopting the nexus approach.

#### DID YOU KNOW?

The solar potential is significant and increases from north to south with the highest potential in Uzbekistan and Turkmenistan. Wind potential is higher in the southern part of Kazakhstan and in the steppes along the Caspian Sea.

**The nexus approach can help governments identify cost-effective and inclusive solutions for low-carbon transition of the energy system in Central Asia, while also mitigating water stress.** A study shows a larger uptake of wind and solar energy in the Syr Darya Basin would lower the dependency on the basin's water resources for electricity generation by 25% by 2030<sup>16</sup>, compared to the business-as-usual scenario. Increased efficiency in the use of water and energy resources<sup>17</sup> is also essential for reducing water stress, contributing to regional security and resilience to climate risks. The energy-water-land nexus assessments could also support Central Asian countries understand trade-offs between planned sectoral measures, such as any negative impacts of a new hydropower plant on ecosystem conservation, food production and flood risk management.

**Nexus planning and development can also strengthen the resilience of people, assets and ecosystems in Central Asia to the negative impacts of climate variability and change.** For example, payment for (water) ecosystem services (PES) could enable downstream and upstream areas to share the costs of water resources management and ecosystem conservation. PES could in turn contribute to managing climate risks for food and energy security. A case study on the Chon-Aksuu area in Issyk-Kul region, for instance, demonstrates that PES can address issues of overgrazed pastures and degraded forests, contributing also to greater water quality and availability<sup>18</sup>.

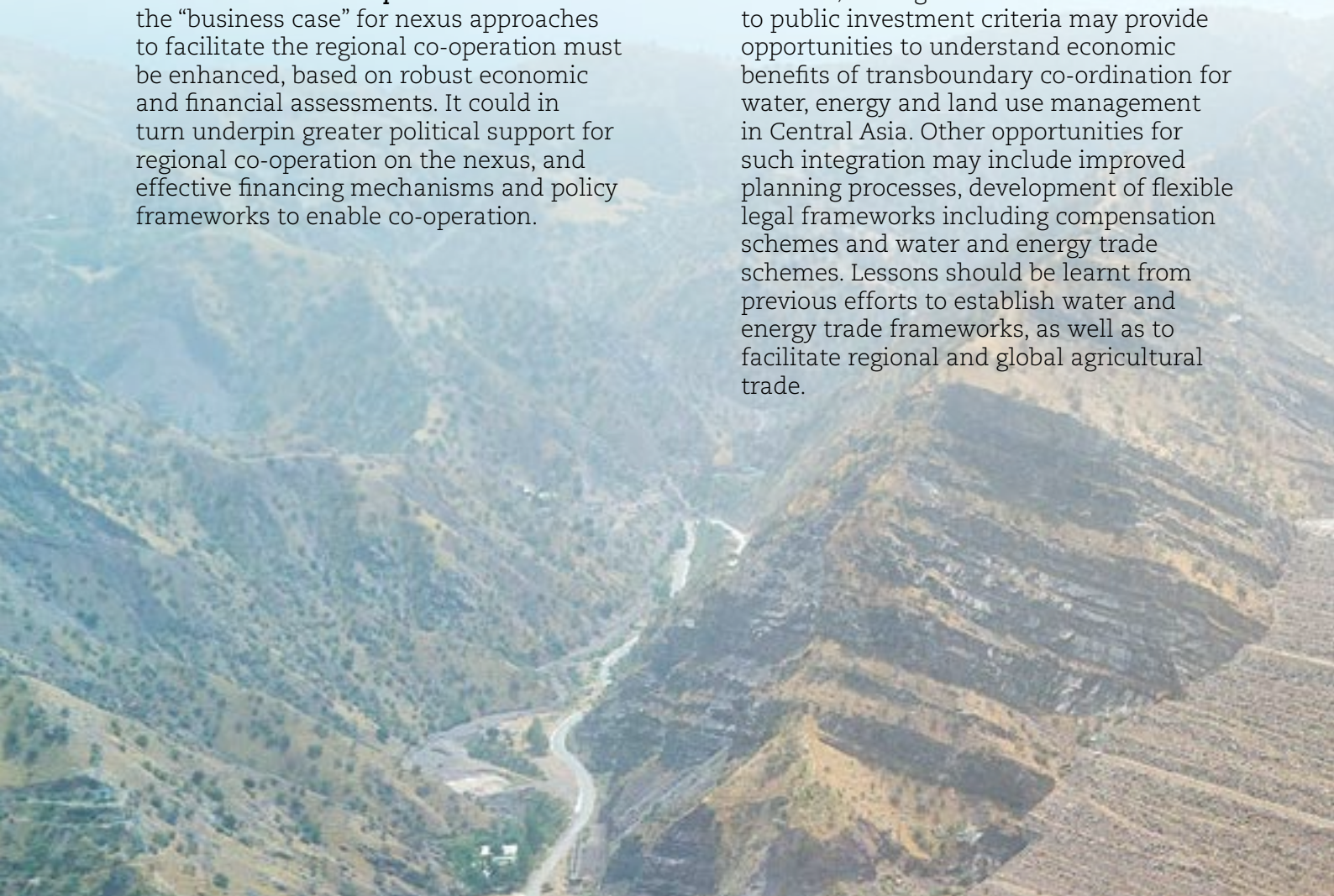
## Proposed actions under the new regional co-operation project on the Nexus (2022-25)

Despite the well-documented benefits, there remain a number of technical, financial and political barriers to operationalising the nexus approach at scale in Central Asia. Key challenges include insufficient information required for decision making, economic and policy incentives, and preparedness to make political decisions. Complex and fragmented institutional arrangements for the governance of energy, water and land resources also hinder cross-sectoral and transboundary co-operation in the region.

**The new energy-water-land use nexus project for Central Asia will aim to overcome these challenges by providing robust evidence base on the effectiveness of nexus approaches in supporting regional security and low-carbon, climate-resilient development.** The project will build on the countries' and development partners' experience of past and on-going initiatives in the nexus within the region and beyond. Further analytical work will explore pragmatic entry points to foster the use of the nexus approaches within regional, national and sub-national development policies. The Project proposes to address the following action points for a greater uptake of nexus approaches in Central Asia:

### *Mainstream the nexus principles into development planning process*

- Developing evidence that demonstrates economic and non-economic benefits for Central Asian countries from adopting nexus approaches to pursue low-carbon and climate-resilient development:** Evidence on the “business case” for nexus approaches to facilitate the regional co-operation must be enhanced, based on robust economic and financial assessments. It could in turn underpin greater political support for regional co-operation on the nexus, and effective financing mechanisms and policy frameworks to enable co-operation.
- Integrating nexus considerations into regional, national and sectoral development policies as well as climate actions to upscale nexus approaches across Central Asia:** For instance, linking the nexus considerations to public investment criteria may provide opportunities to understand economic benefits of transboundary co-ordination for water, energy and land use management in Central Asia. Other opportunities for such integration may include improved planning processes, development of flexible legal frameworks including compensation schemes and water and energy trade schemes. Lessons should be learnt from previous efforts to establish water and energy trade frameworks, as well as to facilitate regional and global agricultural trade.



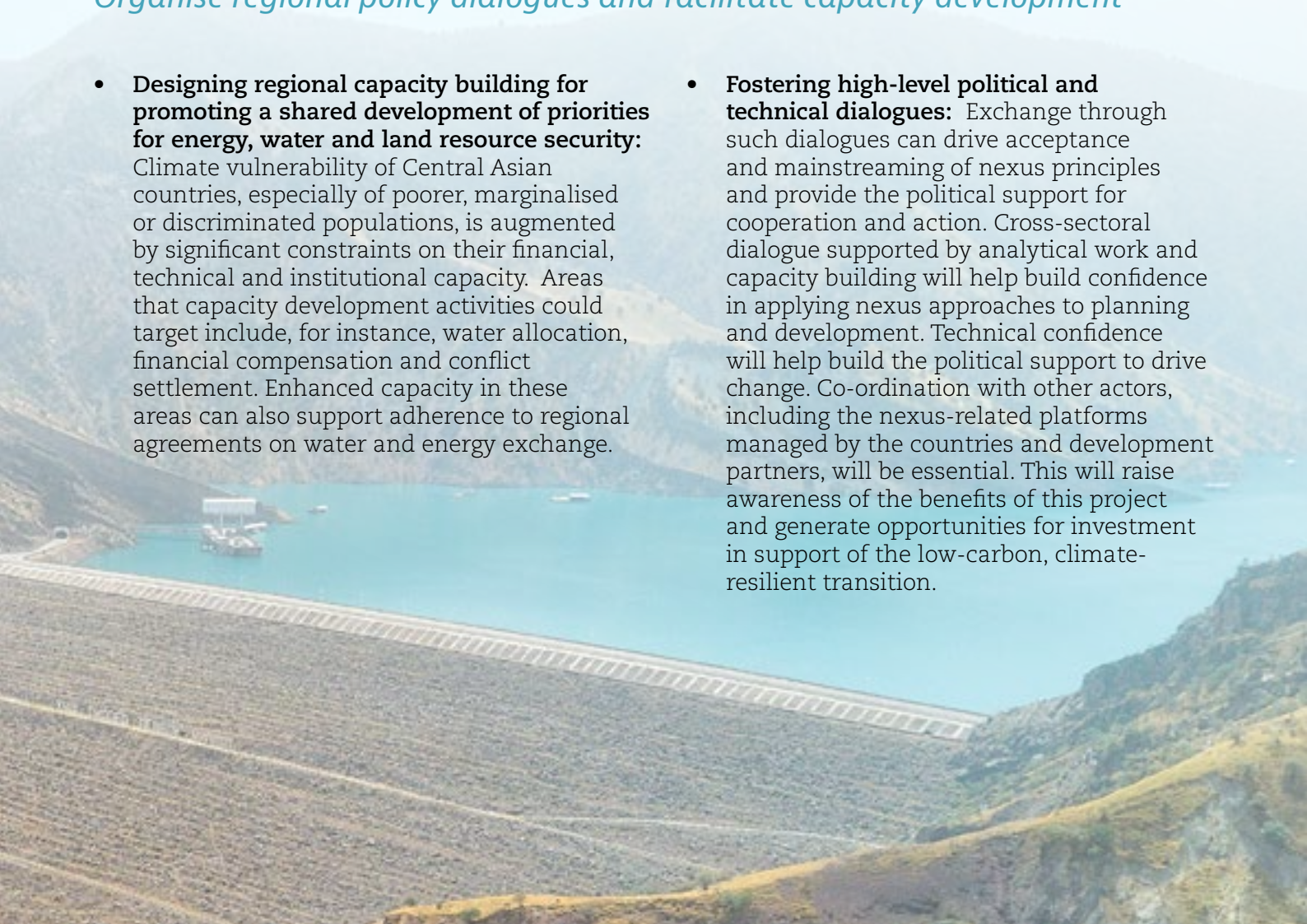


## Finance pilot projects to demonstrate benefits of investments in the nexus

- **Taking the nexus approach as a way of enhancing access to finance:** Access to finance for projects in support of energy, water and land management has consistently been among the greatest challenges facing the countries. The efforts for robust economic analysis and tools for investment decision making could help countries develop a pipeline of financially attractive projects with a focus on the nexus. There would also be a scope for designing a dedicated financing mechanism to invest in such nexus projects. The mechanism would need to demonstrate ‘the art of the possible’ for cross-sectoral projects, strengthening the enabling environments for mobilising finance, and attracting investments by public and private actors.
- **Enhancing the use of decision support tools that explicitly consider benefits and trade-offs of adopting a nexus approach, and uncertainties presented by climate change:** Policy and financial decision making that considers the nexus can be complex, hence can greatly benefit from well-functioning decision support tools that also reflect users’ capabilities. These tools can help to integrate nexus approaches into individual investment projects, such as on modernising national and transboundary energy, water and agriculture infrastructure that was built during the Soviet era.

## Organise regional policy dialogues and facilitate capacity development

- **Designing regional capacity building for promoting a shared development of priorities for energy, water and land resource security:** Climate vulnerability of Central Asian countries, especially of poorer, marginalised or discriminated populations, is augmented by significant constraints on their financial, technical and institutional capacity. Areas that capacity development activities could target include, for instance, water allocation, financial compensation and conflict settlement. Enhanced capacity in these areas can also support adherence to regional agreements on water and energy exchange.
- **Fostering high-level political and technical dialogues:** Exchange through such dialogues can drive acceptance and mainstreaming of nexus principles and provide the political support for cooperation and action. Cross-sectoral dialogue supported by analytical work and capacity building will help build confidence in applying nexus approaches to planning and development. Technical confidence will help build the political support to drive change. Co-ordination with other actors, including the nexus-related platforms managed by the countries and development partners, will be essential. This will raise awareness of the benefits of this project and generate opportunities for investment in support of the low-carbon, climate-resilient transition.



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# Consortium partners

On behalf of:



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety

**giz** Deutsche Gesellschaft  
für Internationale  
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of the Federal Republic of Germany



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The project aims to pave the way for countries to modify planning processes and adopt a whole-of-government approach to addressing the nexus in light of climate change. It will:

- develop tools to increase private sector involvement in nexus-related investments;
- provide mechanisms to quantify and manage the trade-offs that are inherent to nexus projects, promoting integration of policy, technology and investment for climate-resilient transformation; and
- design a pilot financing mechanism to promote uptake of investment in the nexus.

Funded by Germany's International Climate Initiative (IKI) from the German Federal Ministry for Environment and co-financed by the EBRD, the project will be prepared during Q3/4 2021. Working with key stakeholders in each country and other development partners in Central Asia, the consortium will determine during the preparatory phase national and regional priorities and scope work packages for implementation. The main project will be launched in 2022 and have a duration of 4 years.

The project aims to contribute to the initiative 'Green Central Asia' launched by Germany in 2020. The initiative aims to enhance environment, climate and water resilience in the region and support implementation of the EU-Central Asia Strategy of June 2019. Green Central Asia aims to create better access to information and risk analyses in order to enable countries to assess the impact of climate change more accurately and to take preventive measures, while dialogues and workshops will increase decision-makers' capacities to address climate-change related security risks adequately at the national and regional levels. Germany, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Afghanistan have signed a Joint Declaration of Intent on cooperation in the field of climate and security in Central Asia and Afghanistan within the framework of Green Central Asia.

This analysis is conducted within the framework of the GREEN Action Task Force for which the OECD serves as a secretariat.

**For more information**

[www.oecd.org/env/outreach/green-action-task-force/](http://www.oecd.org/env/outreach/green-action-task-force/)

