



# Bioenergy in Countries' Climate Plans

An Analysis of Biomass, Bioenergy  
and BECCS in Nationally  
Determined Contributions  
and Long-Term Strategies

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## Key Points

- **49%** of countries' climate plans (Nationally Determined Contributions submitted to the United Nations) mention biomass, bioenergy or bioenergy combined with carbon capture technology (BECCS).
- **83%** of Long Term Strategies (more detailed climate plans submitted by a smaller number of countries) mention biomass, bioenergy or BECCS.<sup>1</sup>
- Bioenergy - especially burning wood from forests - harms nature and is a false climate solution.
- Some countries' climate plans raise concerns about the use of bioenergy, especially its contribution towards deforestation and its impacts on health and nature. Some of them talk about reducing reliance on bioenergy.
- Some countries, which do not use industrial-scale bioenergy, have the opportunity to leapfrog the technology.

## Introduction

The use of woody biomass at a small scale - for home cooking or heating - has been widespread in the Global South for some time. The industrial-scale use of woody bioenergy has significantly expanded in recent years. Burning woody bioenergy in power stations appears like an elegant solution. The country burning it counts the emissions at the power station as zero. It leaves the carbon impact to the country with the forest the wood comes from. This means many countries export their bioenergy emissions to be dealt with by another country, and in carbon accounts it looks like a neutral, clean form of electricity.

The appeal of industrial-scale bioenergy has led to a huge expansion since 2000. Many governments have subsidised its use to the tune of billions. Five economies - the EU, Canada, Japan, South Korea, and the UK - have spent nearly a quarter of a trillion dollars on biomass subsidies since 2002.<sup>2</sup>

But the growing use of bioenergy has harmed forests and, perversely, made climate change worse. Burning wood for energy releases more carbon dioxide than burning fossil fuels. It damages forest carbon stocks, significantly and permanently reducing them. While those forests may partially recover, data shows that they are likely to never recover to previous levels. In fact data now shows that forests in the global north are on course to change from

being overall carbon sinks to overall emitters of carbon dioxide by the second half of this century.<sup>3</sup> The bioeconomy has been identified as a major driver of this forest degradation.<sup>4</sup>

Under the Paris Agreement, parties (countries) submit plans on cutting emissions to the United Nations. These consist of Nationally Determined Contributions, which look a few years ahead, and Long Term Strategies. In these plans countries describe many of the steps they will take, across public policy and the private sector, to reduce greenhouse gas emissions.

Many countries have included bioenergy in their climate plans. Others have mentioned the future use of Bioenergy with Carbon Capture and Storage technology. The use of forests for woody bioenergy, or converting land to energy crops, poses significant environmental risks - to biodiversity that depends on forests or other natural habitats, to land-based carbon stocks, to ecosystem services, and to people who manage or rely on these ecosystems, and to water resources.<sup>5</sup> Governments have agreed global targets to halt and reverse the loss of biodiversity by 2030. Countries are pursuing a roadmap for a Transition Away from Fossil Fuels - but significant risks exist that this will simply be a transition into so-called "sustainable" or "transitional" fuels, which are effectively bioenergy. The use of biomass for energy, especially forest biomass, will take the planet in the wrong direction. This undermines the integrity of countries' climate plans and will also undermine parallel plans for restoring biodiversity.

## **Key Findings**

Biomass energy is increasingly common in Nationally Determined Contributions (NDC) and Long Term Strategies (LTS). These documents - submitted to the UNFCCC by national governments - are important because they set out the high-level and detailed pathways countries plan to take to transition to low-carbon economies and to reduce emissions.

Some NDCs and Long Term Strategies refer to bioenergy, biomass, or Bioenergy with Carbon Capture and Storage (BECCS). They do not always specify whether this will be burning wood or other feedstocks (for example energy crops). This assessment has focused on references to using bioenergy for power, heating and cooling and using biomass with carbon capture technology.

## **Case Studies: the impacts of bioenergy**

### **Indonesia's tropical rainforest**

Indonesia's NDC refers to a programme to develop the use of degraded land for bioenergy and to support "sustainable biomass plantations". Indonesia has some of the most important forests in the world for biodiversity. Subsidies for bioenergy in Japan and South Korea have driven demand for wood. In 2023 Southeast Asia had a 20% growth in demand for wood pellets for energy. This has led to sourcing from tropical forests in Indonesia. There is also a growing domestic bioenergy industry in Indonesia, as well as increasing exports to other countries in Southeast Asia. Indonesia is aiming to produce 19.5 Terawatt Hours of electricity from biomass, mostly from mixing wood with coal in power plants (biomass co-firing). This is more than Drax's UK power generation of around 12 TWh per year.<sup>6</sup>

## **Estonia's legally protected forests**

Estonia is one of the countries without a mention of bioenergy in its NDC - in fact as an EU Member State it is part of the EU's NDC. Nonetheless, the country is a major supplier of biomass to other European countries and to the UK. In Estonia 5,700 hectares of forests are "Woodland Key Habitat" quality, but aren't formally protected, have been logged, including for wood pellets. Logging licences have been issued for over 82,000 hectares of forests within Natura 2000 areas intended to protect rare and imperilled species. Analysis by PFPI (Partnership for Policy Integrity) has found over 600 instances of logging inside Natura 2000 forests across Europe between 2001-2023 (this is likely only a fraction of logging within Natura 2000 forests since they only analysed a sample of those sites).<sup>7</sup> Estonia's land sector has recently started to release more carbon than it absorbs due to logging, with the Government predicting this will remain the case until 2050. In Estonia, culturally important "cross trees," which commemorate the dead, have also been impacted by logging – something the UK's sustainability criteria should prevent.<sup>8</sup> Analysis by Cut Carbon Not Forests has found that in Estonia damage is being done to ecosystems and biodiversity that should make it ineligible for sustainability certification.<sup>9</sup>

## **Drax burning Canada's ancient forests**

Canada's NDC explicitly mentions the future use of Bioenergy with Carbon Capture and Storage. The country is also a major exporter of biomass to Europe. Drax power station in the UK has imported millions of tonnes of wood from Canada to burn. In Canada, biomass is sourced from industrially logged areas of the boreal forest. Much of the logging in Canada takes the form of clearcutting, typically targeting older stands that support rich and unique biodiversity such as the woodland caribou. The Canadian boreal forest is home to billions of birds of over 300 species, many of which breed there.<sup>10</sup> A February 2024 investigation shows that Drax continues to use trees from primary and old forests – some of which are over 250 years old – to make wood pellets in Canada.<sup>11</sup> After a BBC Panorama investigation in 2022, Drax shifted its sourcing policy away from logging its own trees and towards buying trees from other companies. But investigations show that in British Columbia these trees are still trees from other companies. But investigations show that in British Columbia these trees are still originating from primary forests, old growth forests, and ancient forests.<sup>12</sup> Often, the clearcut forests are replanted with less diverse and less resilient species of saplings.<sup>13</sup> Under the existing sustainability scheme, the Drax power station has very likely burned wood from primary and old growth forests in Canada. In fact leaked emails from Drax show that internally the company acknowledged it had likely burned this material.<sup>14</sup>

## Recommendations

NDCs and LTSs are plans that give an insight into what countries are already doing on climate change, and plan to do in the future. They do not necessarily set direction, but often summarise laws, policies, and funding that a country has planned.

- NDCs and LTSs vary hugely in quality, format and detail. Some countries have submitted NDCs and LTSs that do not mention bioenergy, even though there is bioenergy use in those countries. The UNFCCC could help by setting out more clear guidance (or rules) on the format and contents of NDCs and LTSs.
- For parties that already use bioenergy, they have the opportunity to reduce their reliance. This will involve phasing out any subsidies or incentives for bioenergy and reinvesting in genuinely low-carbon and renewable sources of energy.
- Countries should also put in place strong protections for forests. These should span forests in temperate and boreal regions, in the Global North, as well as tropical forests.
- Countries that do not use bioenergy should explore ways to leapfrog it and avoid using it in their energy systems. They should keep targets for emissions reductions and emissions removals separate. This will avoid creating a reliance on removal technologies like BECCS to make carbon budgets balance on paper.
- Include robust and appropriate safeguards to prevent reliance on bioenergy within national and international contexts - including in roadmaps for transitioning away from fossil fuels and protection of forests.



Biomass clearcutting in Estonia, credit: Karl Adami

# Endnotes

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