

Drawdown FAQ's

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The Basics

What is Drawdown - Drawdown is the point in time when the concentration of greenhouse gases in the atmosphere peak and begin to decline on a year to year basis.

Goal of the Drawdown Project - To identify, measure and model the 100 most impactful, substantive solutions to global warming that either reduce emissions or remove greenhouse gases from the atmosphere and to determine whether it is possible to achieve Drawdown within the next 30 years, by 2050.

Drawdown Team - Drawdown is a coalition of over 200 contributors from over 22 countries including 62 researchers, 130 advisors and 49 outside experts.

How to achieve Drawdown - To achieve drawdown we need to draw greenhouse gases down from the atmosphere back to the earth. This already happens every year via photosynthesis but we have to rebalance the quantity of emissions with the earth's capacity to bring those gases back home.

The Mandate - To map, measure and model substantive, technological, ecological, and behavioral solutions and analyze their potential to reduce and draw down greenhouse gases over a 30 year period.

Greenhouse Gases - Greenhouse gases include carbon dioxide, methane, fluorinated gases and several others all with different global warming impacts. To enable consistency, scientists calculate the warming potential of different greenhouse gases and convert it to a carbon equivalent to use as a common 'carbon' currency. In Drawdown, references to carbon dioxide include the impact of other, equivalent greenhouse gases, such as methane or fluorinated gases, based on their global warming potential.

The Science behind Drawdown

Assessment - The project focussed on existing solutions with sufficient data available for global modelling. The solutions were then evaluated based on their current performance, scalability, economic viability, potential to reduce greenhouse gases over 30 years and the balance of other positive/negative impacts.

Three-stage Process - Every solution was researched in a 3 step process:

- (i) analyzing technical reports with financial and climate data;
- (ii) reviewing to ensure data integrity;
- (iii) modeling to assess integration of solutions and eliminate double counting.

Modelling - Each solution is measured and modeled to determine its global carbon impact between 2020-2050. The results include the (i) ranking (ii) carbon avoided, reduced, or sequestered (iii) the cost to implement and (iv) net cost/savings over a 30 year period. The impacts are quoted in gigatons of carbon dioxide referenced against a 'business as usual' baseline.

Scenarios - Three different scenarios were modelled using different underlying assumptions (e.g. future growth rates, cost reductions, improvements in tech etc). The most conservative scenario (the "plausible" scenario in the book) reaches drawdown by 2060, the middle "drawdown" scenario by 2050 and the more aggressive, or "optimum" scenario, reaches drawdown potentially as early as 2045.

The Findings

Ranking - The solutions are ranked based on total amount of carbon they can potentially avoid or remove from the atmosphere on a global basis over a 30 year period.

Sectors - The top 80 solutions are grouped into seven sectors:

Energy	Food	Women & Girls	Building & Cities	Land Use	Transport	Materials
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Top 10 Ranked Solutions

#1 Refrigerant Management	#6 Educating Girls
#2 Wind Turbines (onshore)	#7 Family Planning
#3 Reduced Food Waste	#8 Solar Farms
#4 Plant Rich Diet	#9 Silvopasture
#5 Tropical Forests	#10 Rooftop Solar

Co-Benefits - Nearly all the solutions are 'no regrets' solutions, meaning, they have so many advantages they are commendable irrespective of their impact on greenhouse gases. These co-benefits include saving money, creating jobs, enhancing security, advancing human health, eliminating hunger, preventing pollution and restoring the environment.

The Plan - Of the 80 ranked solutions some have more impact than others, but there is no silver bullet and no 'small' solutions. Reversing global warming is not possible unless we do them all. Under the Drawdown Scenario, over a 30 years period, the 80 solutions would draw down 1,442 GT of carbon equating to a net carbon reduction of .59GT by 2050 - this is drawdown.

Net cost to reverse Global Warming - The total "first cost" to implement all 80 modelled solutions is \$129 trillion over 30 years under the plausible scenario. That's \$27 trillion over what "business as usual" would cost, for example the cost of using solar instead of coal. The net operating cost for all solutions over 30 years is actually a **savings** of \$78 trillion. So at the point of drawdown in 2050 the total net savings will be \$51 trillion!

Coming Attractions - In addition to the top 80 solutions, the book includes 20 "coming attractions". These are 20 emerging solutions that, while they are scientifically valid, as yet there is insufficient economic and/or scientific data to accurately model the net impact on carbon and cost. These innovations include marine permaculture, smart grids, the hyperloop, autonomous vehicles and living buildings.

Glossary

Global Warming: Global Warming refers to the surface temperature of the earth. Climate Change refers to the many changes that will occur due to the increase in greenhouse gases and consequential rise in temperature. Drawdown focusses on the reduction of greenhouse gases to reverse global warming.

Gigaton: The solutions are ranked in terms of gigatons of carbon dioxide removed from the atmosphere. A gigaton is a billion metric tons. To put this in perspective, imagine 400,000 Olympic sized pools. That's about a billion metric tons of water, or 1 gigaton. Or a blanket (~.42 inches deep) covering the entire USA would represent the scale of 1 metric gigaton of carbon emissions.

For more information see www.drawdown.org and www.pachamama.org