

## The Renewable Fuel Standard: Understanding the U.S. federal biofuels mandate and its environmental risks

The Renewable Fuel Standard is a federal mandate that requires the blending of biofuels into U.S. transportation fuel. The RFS was created under the Energy Policy Act of 2005, and expanded under the Energy Independence and Security Act of 2007. The original intent of the RFS was to drive the production of alternatives to gasoline that would decrease the nation's dependence on foreign oil and lower U.S. greenhouse gas emissions.

Unfortunately, several studies, including a recent National Academy of Sciences study, have found that the RFS is actually increasing air pollution and greenhouse gas emissions, degrading water sources, and damaging biodiversity.<sup>1,2</sup> Moreover, the study found that globally, biofuels expansion accounted for 20-40 percent of the

food price increases seen in 2007, which led to a global food crisis that pushed 100 million people into hunger and sparked riots in 30 countries.<sup>3</sup>

Currently, over 95 percent of the RFS is being met with corn ethanol, a fuel that has serious negative consequences for the environment, society and consumers.<sup>4</sup> However, advanced biofuels, which are slated to play a much larger role in the U.S. biofuels economy in coming years, pose similar risks. The federal government should not mandate the commercial production of biofuels, conventional or advanced, before we fully understand the risks they pose to our natural resources and global communities.

Fuel	What is it?	Example feedstocks	Required reduction in ghg emissions compared to petroleum-based fuels to qualify under RFS	Total gallons mandated by RFS in 2022
<b>Conventional Biofuel</b>	Any biofuel – primarily corn ethanol	Corn	At least 20% reduction	15 billion
<b>Advanced Biofuel</b>	Includes cellulosic, biomass-based diesels, and any other biofuel not made from corn starch	Sugarcane	At least 50% reduction	4 billion*
<b>Biomass-Based Diesel (subset of advanced)</b>	Diesel produced from plant oil or animal fat	Soybean, palm, canola	At least 50% reduction	1 billion**
<b>Cellulosic Biofuel (subset of advanced)</b>	Fuel derived from the structural tissues of crop residues i.e. stalks, leaves, bark	Switchgrass, algae, stover, wood	At least 60% reduction	16 billion

Information gathered from the National Academy of Sciences, "Renewable Fuel Standard: Potential Economic and Environmental Effects of U.S. Biofuels Policy: Report in Brief," 2011.

\*This 4 billion is expected to come from "other advanced" fuels that are neither cellulosic nor biomass-based diesel

\*\* The RFS does not include volume mandates for the biomass-based diesel mandate past 2012, but it is likely the volume will remain fixed around roughly 1 billion gallons per year

1 National Research Council. Renewable Fuel Standard: Potential economic and environmental effects of U.S. biofuel policy. Washington, DC: The National Academy of Sciences Press, 2011. [http://www.nap.edu/catalog.php?record\\_id=13105](http://www.nap.edu/catalog.php?record_id=13105).

2 U.S. EPA. Biofuels and the Environment: the First Triennial Report to Congress (External Review Draft). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/183A, 2011.

3 Action Aid. "Meals Per Gallon: The impact of industrial biofuels on people and global hunger." 2010. [http://www.actionaid.org.uk/doc/lib/meals\\_per\\_gallon\\_final.pdf](http://www.actionaid.org.uk/doc/lib/meals_per_gallon_final.pdf).

4 Environmental Working Group. 2012 Ethanol Report. <http://www.ewg.org/report/ethanol/environmental>.

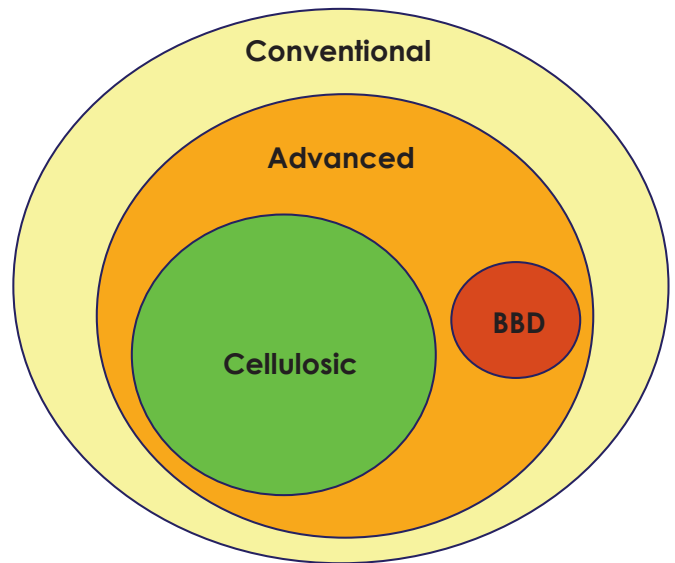


### Specific fuel requirements:

The RFS contains four biofuel categories: conventional, advanced, biomass-based diesel and cellulosic. The categories are differentiated based on specific feedstock and lifecycle greenhouse gas emissions requirements.

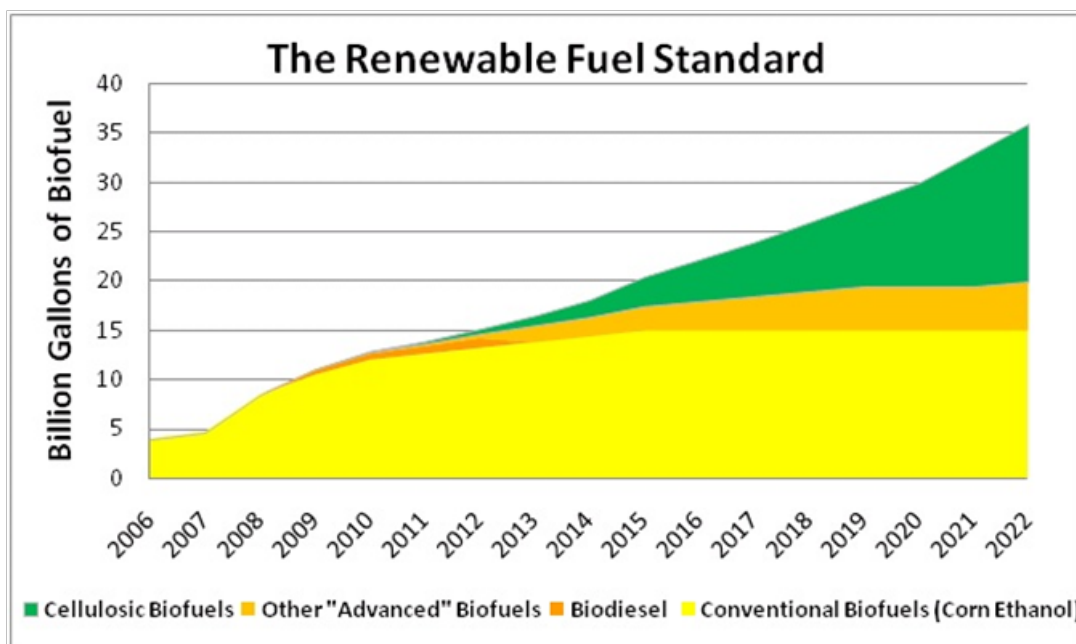
The RFS consists of a single mandate for renewable fuel, with separate, smaller mandates embedded within it. Nested within the renewable fuel mandate is a mandate for advanced biofuels. Nested within the advanced mandate are separate quotas for cellulosic fuel and biomass-based diesel. A gallon of cellulosic biofuel counts towards the mandate for cellulosic fuel, as well as the advanced and conventional fuel mandates. A gallon of corn ethanol, however, only counts towards the overall mandate and not the advanced or cellulosic quotas. Since conventional biofuels are the cheapest to produce, they are expected to fill up as much of the mandate as is available to them. The same is true for non-cellulosic advanced biofuels.

### Total renewable fuel



### Increasing volume requirements:

The RFS volume requirements increase every year through 2022. Currently the RFS requires 15.2 billion gallons of biofuels to be used in 2012 – 3 billion gallons from advanced biofuels and 12.2 billion gallons from corn ethanol. By 2022, the RFS will require the annual use of 36 billion gallons of biofuels – 21 billion gallons from advanced biofuels and 15 billion from corn ethanol.



### Important environmental provisions within the RFS:

The RFS includes three important environmental provisions, created as safeguards against environmental harm from increased biofuels production:

- **Greenhouse gas standards:** Biofuels must meet specific lifecycle ghg standards to qualify as renewable fuels under the RFS (described above).
- **Recognition of indirect land use change:** Indirect land use change occurs when new land is cleared to produce food or feed because the original farmland has been rededicated to biofuel feedstock production instead of food. Land-clearing can cause massive amounts of carbon pollution through activities like deforestation. These emissions are accounted for during the biofuel lifecycle analysis that is used to determine if a fuel meets the required ghg standards.
- **Forest and ecosystem protections:** In order to qualify for the RFS, a biofuel must be made from “renewable” biomass. The definition of “renewable” excludes certain ecosystems, including federal forests and agricultural land. These exclusions safeguard many important and fragile ecosystems by precluding biofuel producers from using those lands for biofuel feedstock production.





## Environmental problems and risks posed by the RFS:

However, despite these safeguards, the RFS protections are inadequate to ensure that biofuel production does not lead to environmental degradation. The following are some of the shortcomings of the RFS environmental safeguards:

- **Lack of protection for water, soil and air:** There are no standards within the RFS that guard against the degradation of waterways, soil health, or air quality from biofuels production. Many EPA-approved biofuel feedstocks, both conventional and advanced, have already been shown to be invasive,<sup>5</sup> exacerbate soil erosion, increase deforestation and increase water pollution.<sup>6</sup> Popular feedstocks like soy and sugar cane are driving deforestation and competing with food crops for land<sup>7</sup> while domestic feedstocks including miscanthus grass and algae have invasive qualities that could threaten waterways and biodiversity.<sup>8</sup>
- **Greenhouse gas loophole for corn:** The RFS includes a “grandfather clause” that exempts almost all domestic corn ethanol from meeting the 20 percent ghg emission reduction standard imposed on renewable fuels. EPA estimates that 14.8 billion gallons of corn ethanol will be exempt from this standard,<sup>9</sup> despite the fact that the EPA’s own data show that most corn ethanol production actually results in *more* ghg emissions than traditional gasoline.<sup>10</sup>
- **Greenhouse gas “escape hatch”:** EPA can reduce the ghg requirements within the RFS if the biofuels industry fails to produce adequate amounts of commercially-viable biofuels that meet those standards. The National Academy of Sciences recently found that the advanced and cellulosic biofuels industries are unlikely to fill their mandates due to exorbitantly high costs.<sup>11</sup> Thus, EPA could

choose to lower the ghg standards within the RFS. This could allow for more environmentally-degrading fuels to fill the mandate, such as palm-oil diesel, which is a leading cause of deforestation in many tropical regions.<sup>12</sup>

The RFS is a mandate for the production of biofuels that damage the environment, cause climate pollution, and exacerbate hunger. Over the next decade, the RFS will require the production of more than double the amount of biofuels currently in use. This massive expansion in biofuels production has the potential to poison our natural resources, strangle the amount of cropland dedicated to food, and increase global food insecurity. The federal government should not mandate the commercial production of biofuels before the risks they cause to the environment and public health are fully understood.

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5 Glaser, Aviva and Glick, Patty. “Growing Risk: Addressing the invasive potential of bioenergy feedstocks.” National Wildlife Federation. 2012.

6 Early, Jane and McKeown, Alice. “Smart Choices for Biofuels.” Worldwatch Institute and the Sierra Club. 2009.

7 Friends of the Earth Europe. “From Forest to Frok: How cattle, soy and sugar are destroying Brazil’s forests and damaging the climate.” December 2010.

8 Glaser, Aviva and Glick, Patty. “Growing Risk: Addressing the Invasive Potential of Bioenergy Feedstocks.” National Wildlife Federation. April 4, 2012. <http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2012/04-04-12-Growing-Risk.aspx>.

9 Environmental Protection Agency, Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis, February, 2010.

10 McMahon, Kate and Witting, Victoria. “Corn Ethanol and Climate Change.” Friends of the Earth U.S. 2011.

11 National Research Council, 2011.

12 Joanna M. Foster. “A Grim Portrait of the Palm Oil Emissions.” New York Times. May 1st, 2012. <http://green.blogs.nytimes.com/2012/05/01/a-grim-portrait-of-palm-oil-emissions/>.