EIA's Long-Term Biofuels Outlook

Biofuels: Continuing Shifts in the Industry and the Long-Term Outlook

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Independent Statistics and Analysis

Outline

- Projection highlights and assumptions behind projections
- RFS2 mandate
- Projections
  - AEO2010 reference case
  - AEO2009 price cases
  - Waxman-Markey
- Projections of E85 and E10
- Future Issues

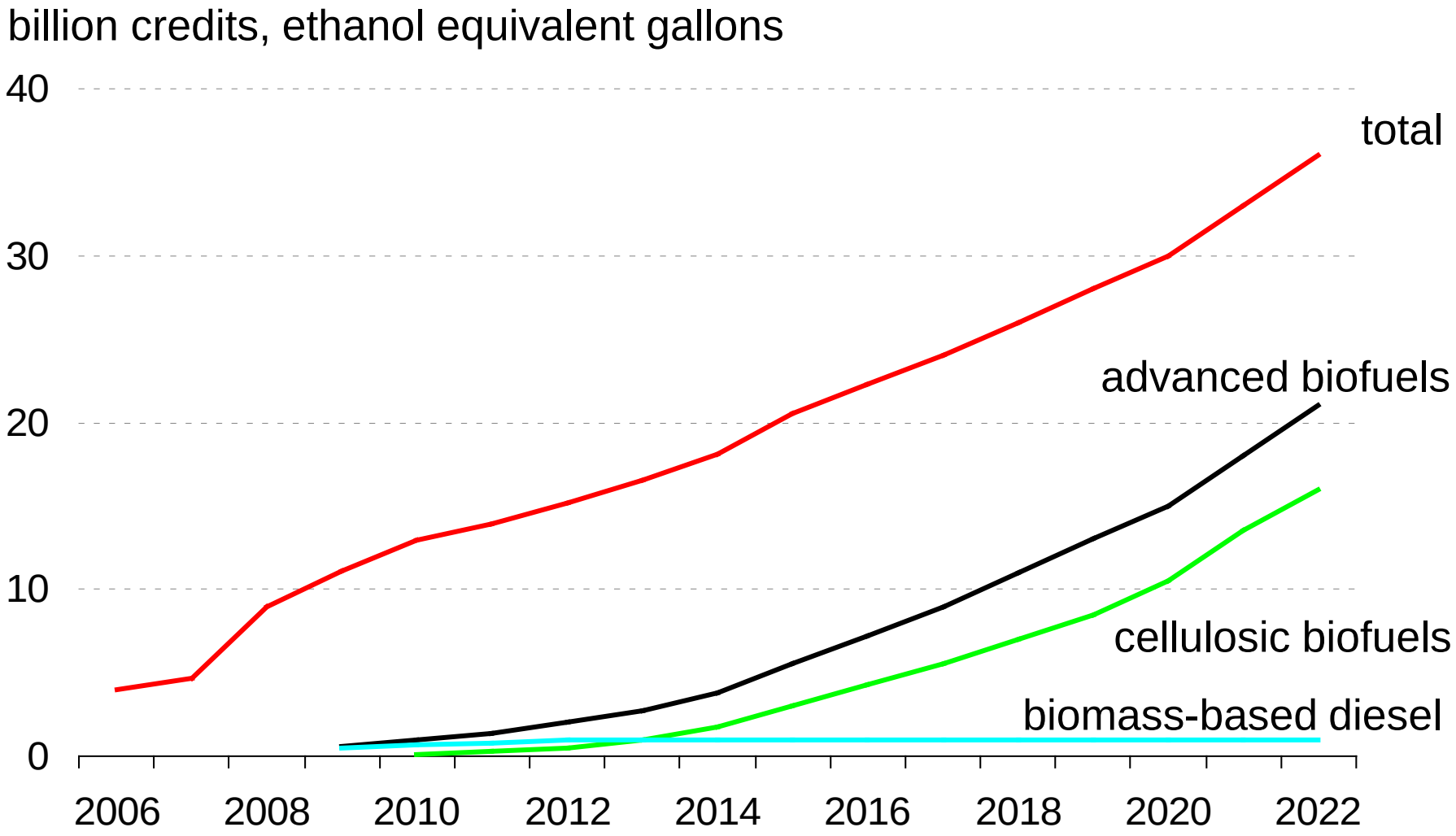
Highlights of projection cases

- AEO2010 reference case projections
  - Biofuels account for most of the projected growth in liquid fuels consumption
  - RFS met at about 26 billion gallons in 2022
  - Renewable fuel growth limited by the projected ramp rate of cellulosic fuels
  - Biofuels do become competitive relative to petroleum-based fuels later in the long-term
- Oil price case comparisons
  - Biofuels meet RFS2 mandate sooner in high oil price case
- Climate change policy case
  - Stronger biofuels growth under Waxman-Markey due to assumed carbon neutral combustion of biofuels

Assumptions for biofuels projections

- Blender's tax credit of $0.45 per gallon for ethanol to expire in 2010, and the $0.54 per gallon tariff
- Cellulosic biofuel tax credit (in addition to BTC) at $0.56 per gallon to expire 2012
- Biodiesel $1 per gallon tax credit expired 2009
- Growth of cellulosic technology
- E10 and E85 only
- All biofuels assumed to qualify under RFS2 GHG standards
- California LCFS excluded in AEO2010, but will be included in AEO2011

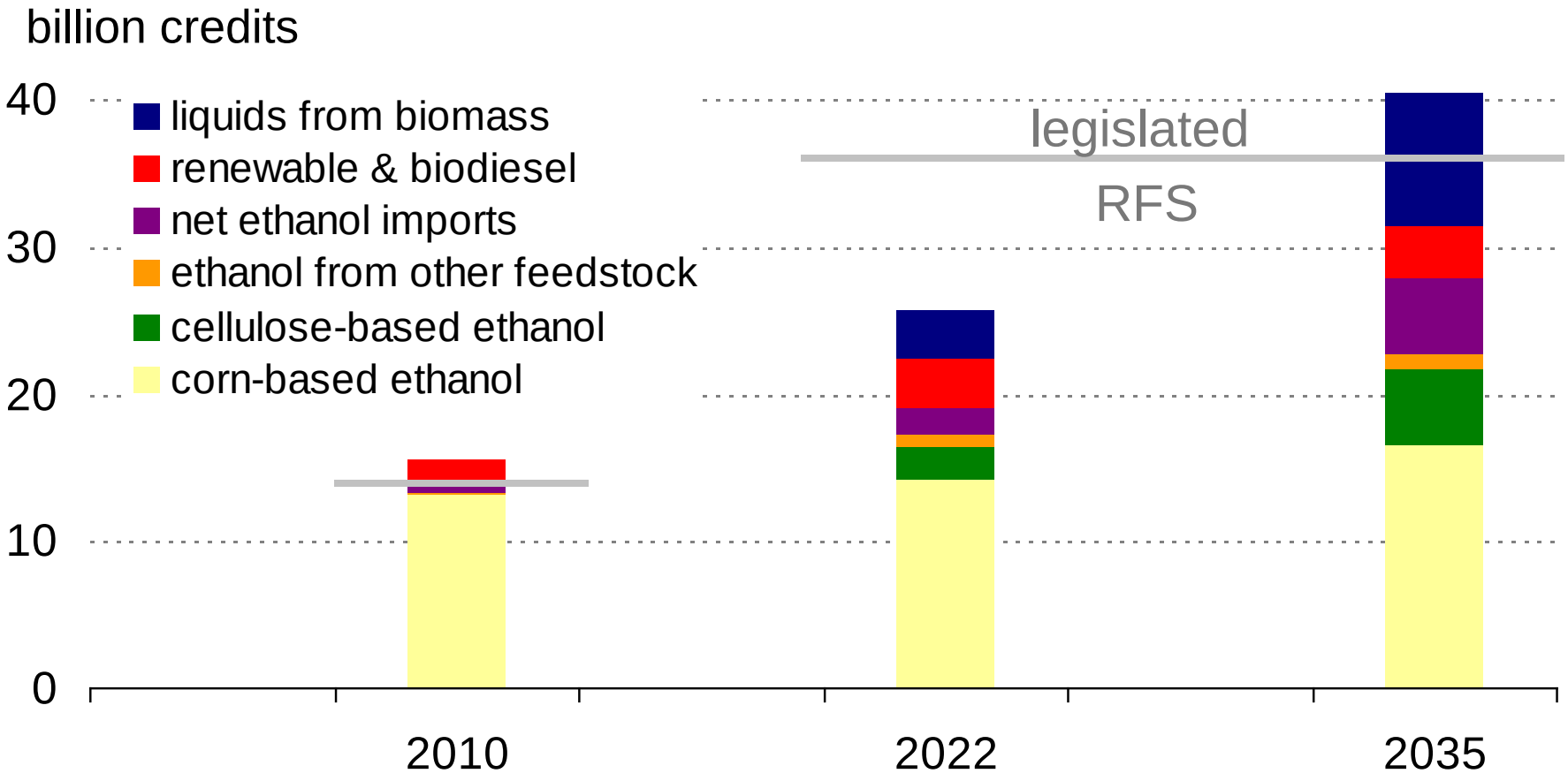
EISA Renewable Fuel Standard (RFS2)



Source: EIA, Annual Energy Outlook 2010

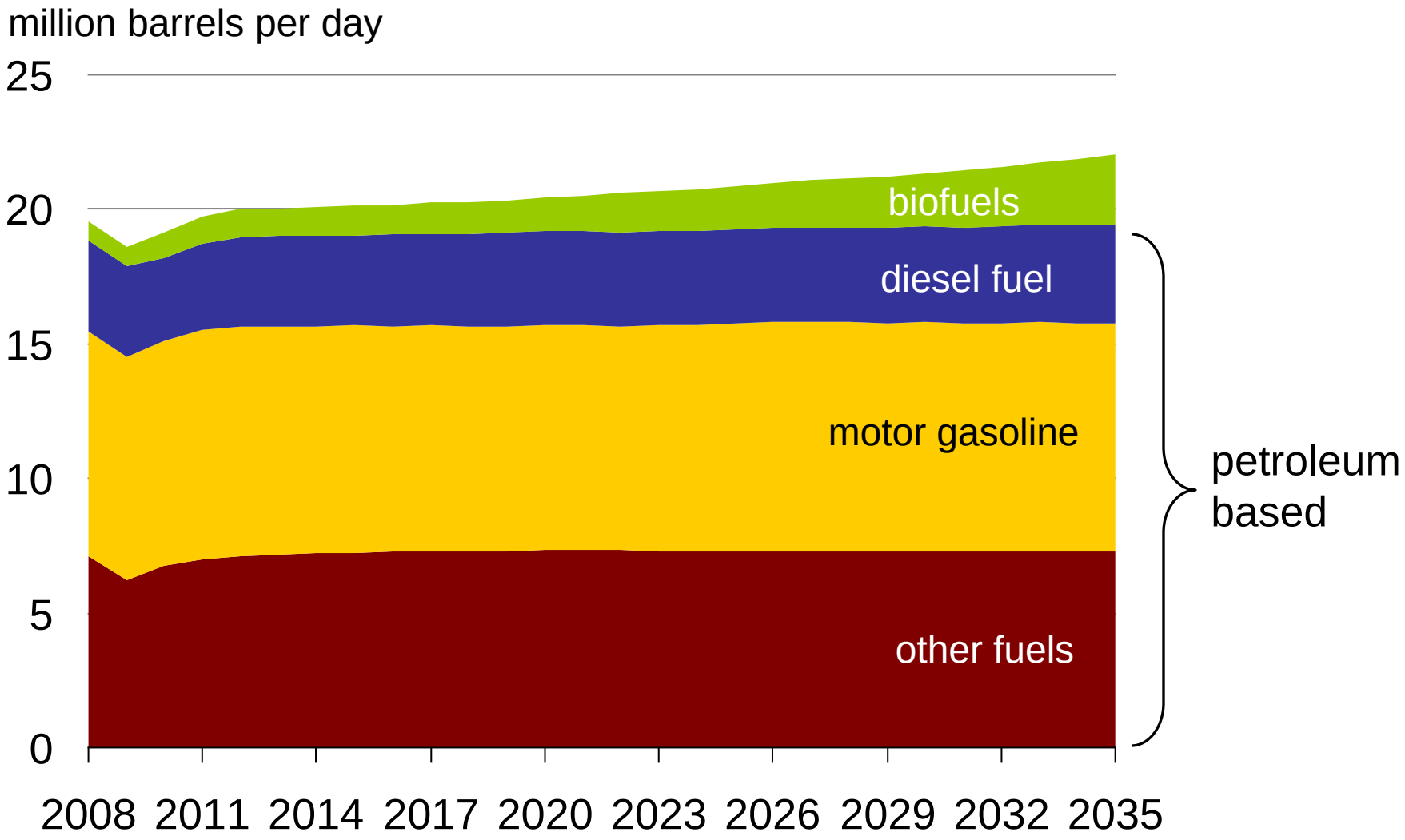
Meeting renewable fuel standards, AEO2010

2022 volumes do not meet 36 billion gallons of credits because cellulosic biofuel technology does not ramp up to 16 billion gallons



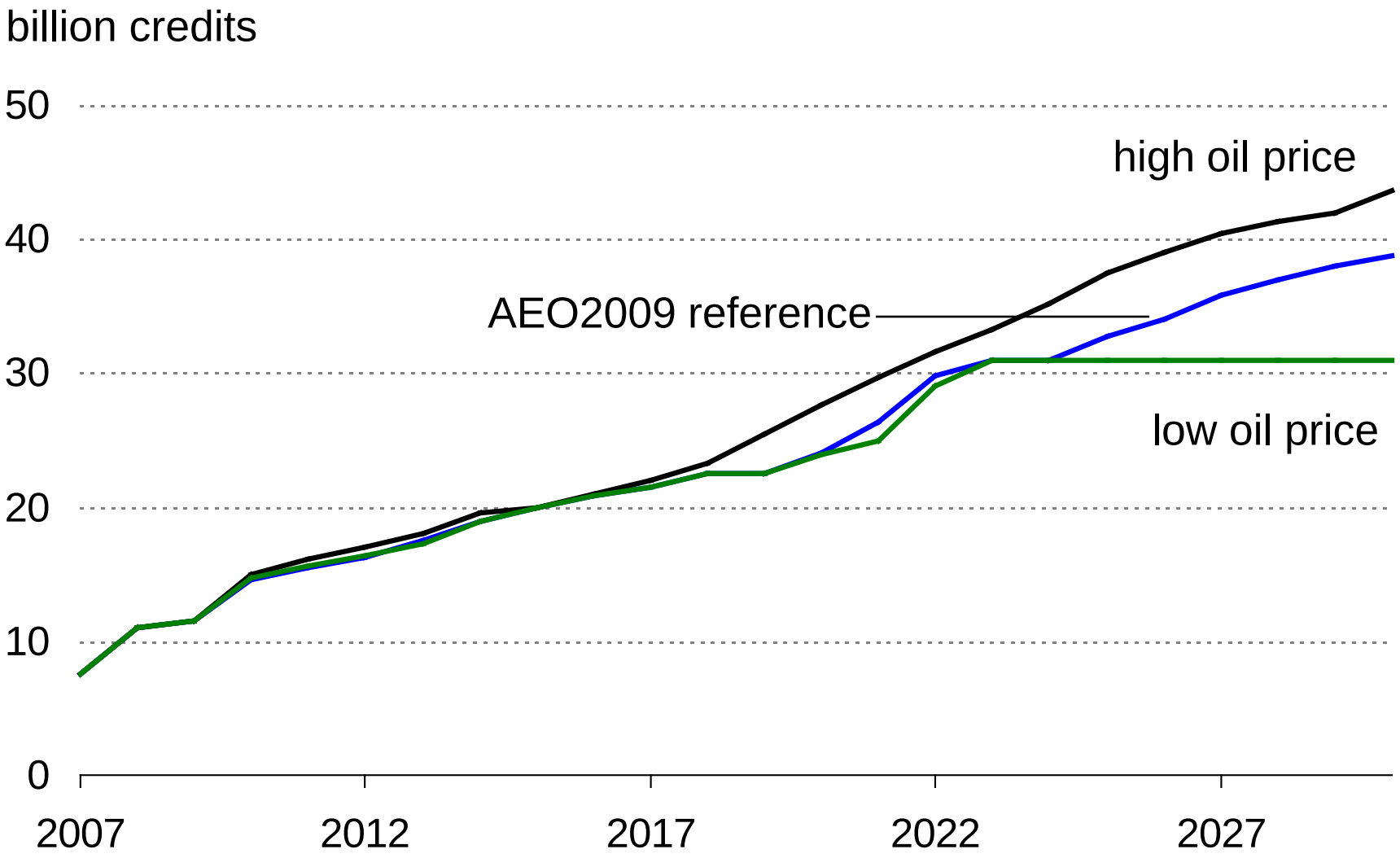
Source: EIA, Annual Energy Outlook 2010

Components of liquid fuels products, AEO2010



Source: EIA, Annual Energy Outlook 2010

Effect of petroleum price on biofuel production, AEO2009

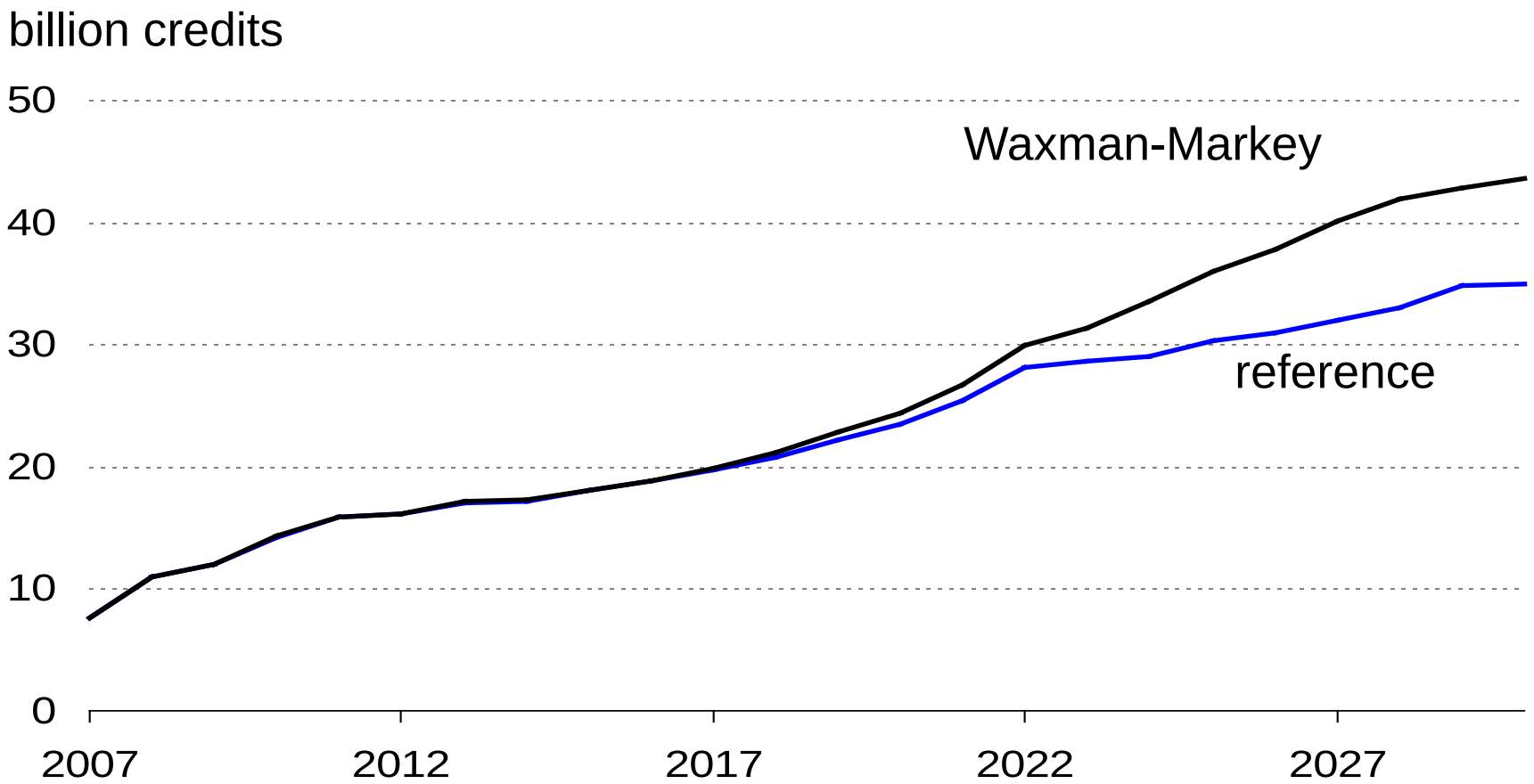


Source: EIA, Annual Energy Outlook 2009

Effect of cap and trade policy on biofuel production

Biofuels consumption higher due to carbon-neutral assumption (less processing)

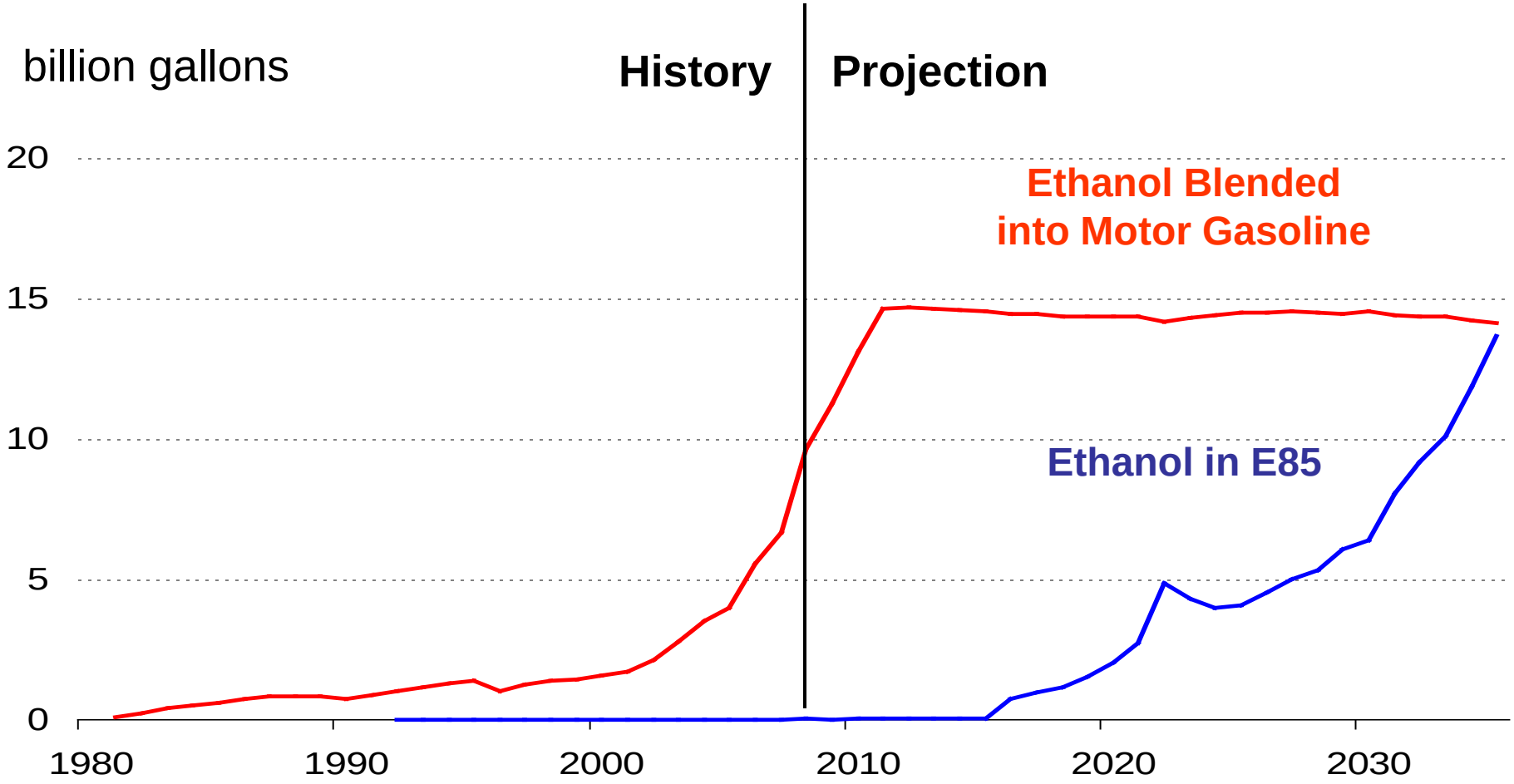
On a market share basis biofuels move from 11% to 13% of motor fuels consumption



Source: EIA, Annual Energy Outlook 2009, Stimulus and WM

Ethanol consumption, AEO2010

- An E15 or other waiver would affect both E85 volumes and ethanol pricing
- BTL and other non-ethanol biofuels provide competition to ethanol as E85 after 2022



Source: EIA, Annual Energy Outlook 2010

Future issues

- Petroleum refinery industry actions in a stagnant/declining market and potential changes in allowable ethanol blends (E15)

- Biofuel Supply:
  - Capability of biofuel developers to achieve production cost targets
  - Development of a non-grain feedstock market
  - Brazilian supply: sugarcane and cellulosic?
  - Investment in long-lived capital assets where value is directly tied to volatile crude oil markets

- Viability of E85 as an outlet fuel market
  - Transition of ethanol to energy-equivalent pricing
  - The build-out of retail outlets to meet a demand that could become non-existent

Future Issues

- Low Carbon Fuel Standard (LCFS)
  - California's regulation has been enacted, other states may follow
  - Variability of Carbon Intensities (CIs), CIs of new fuels
  - National level LCFS is a possibility
  - Sensitivity of biofuels supply with respect to carbon assignments
- Cap and Trade legislation
  - Biofuels assumed to be largely carbon neutral, but will this change?
- Technological improvements possible in reducing carbon footprint in response to climate change legislation
  - Refineries
  - Corn ethanol and other biofuels

Thank you

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