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The US Waxman–Markey climate change bill

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Introduction

President Barack Obama promised to bring change to the United States, and addressing climate change is one of his administration's major areas of focus. In his 2010 Budget Proposal, he called for Congress to develop an economy-wide emissions trading scheme to reduce emissions by approximately 14 per cent below 2005 levels by 2020, and 83 per cent below 2005 levels by 2050.¹

Various bills addressing climate change have been put before Congress in the past, but have received little support. The bill most recently introduced and currently under consideration by the US Congress is known as the 'Waxman bill' or 'Waxman–Markey bill' because it was introduced by Congressmen Henry Waxman (Democrat of California and Chairman of the Energy and Commerce Committee) and Edward Markey (Democrat of Massachusetts and Chairman of the Energy and Environment Subcommittee). The formal title is 'H.R. 2454—The American Clean Energy and Security Act of 2009'. The legislation was approved by the Energy and Commerce Committee on 21 May 2009.² The approval of the Energy and Commerce Committee is a significant step in the passage of the bill through Congress, and this, combined with the support of the Obama administration, suggest that this bill may well succeed where others failed.

The bill's centrepiece is an emissions trading scheme (ETS).³ However, it also includes other major complementary and reinforcing initiatives on clean energy and energy efficiency. An overview of each of these three major components is given below, with particular focus on the ETS. Following this, the current status and next steps for the bill are briefly outlined.

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1. Office of Management and Budget, *A new era of responsibility: renewing America's promise*, Executive Office of the President of the United States, 2009, p. 21, viewed 10 June 2009, http://www.whitehouse.gov/omb/assets/fy2010_new_era/A_New_Era_of_Responsibility2.pdf
 2. US House of Representatives Committee on Energy and Commerce, 'Energy and Commerce Committee passes comprehensive clean energy legislation', Committee on Energy and Commerce website, viewed 10 June 2009, http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1630:energy-and-commerce-committee-passes-comprehensive-clean-energy-legislation&catid=122:media-advisories&Itemid=55; the website contains a link to a copy of the bill. Further useful references including the Committee summary of the bill as reported, and the Pew Center summary of the bill, are available through links at 'American Clean Energy and Security Act (Waxman–Markey bill)', Pew Center on Global Climate Change website, viewed 12 June 2009, <http://www.pewclimate.org/acesa>
 3. A similar policy tool has been used in the US to address the problem of acid rain. The introduction of caps on emissions and market trading of permits for sulphur dioxide (SO₂) emissions has been successful in reducing SO₂ emissions, which has decreased acid rain, and is thought to have done so at much lower costs than could have been achieved through traditional government regulatory measures.

Finally, a comparison of the main features of the bill with the Australian Government’s proposed Carbon Pollution Reduction Scheme (CPRS) is provided.

Emissions trading scheme

Emissions reduction targets

The bill calls for a 20 per cent economy–wide reduction in emissions below 2005 levels by 2020, and 83 per cent economy–wide reductions below 2005 levels by 2050. The emissions reductions for capped sources (i.e. sources that are covered under the ETS) are slightly different: 17 per cent below 2005 levels by 2020, and 83 per cent below 2005 levels by 2050. The bill also lays out targets for interim years, as shown in the table below.

Table 1: Emissions reduction targets (below 2005 levels) in the Waxman bill, economy–wide and for capped sources

	2012	2020	2030	2050
Economy–wide	3%	20%	42%	83%
Capped sources	3%	17%	42%	83%

Source: American Clean Energy and Security Act of 2009, Title VII—Global warming pollution reduction program, Part A—Global warming pollution reduction goals and targets, Sections 702 and 703.

Greenhouse gases regulated under the ETS

The ETS applies to the following greenhouse gases (GHGs)⁴:

- carbon dioxide (CO₂)
- methane (CH₄)
- nitrous oxide (N₂O)
- sulphur hexafluoride (SF₆)
- hydrofluorocarbons (HFCs) from a chemical manufacturing process at an industrial stationary source
- any perfluorocarbon (PFC)
- nitrogen trifluoride (NF₃), and
- any other anthropogenic gas designated as a greenhouse gas by the Administrator of the Environmental Protection Agency (EPA).

4. American Clean Energy and Security Act of 2009 (ACESA), Title VII—Global warming pollution reduction program, Part B—Designation and registration of greenhouse gases, Section 711.

This covers the GHGs that are currently controlled under the Kyoto Protocol (CO₂, CH₄, N₂O, HFCs, PFCs and SF₆) as well as additional HFCs, PFCs and NF₃, with potential for more gases to be included (an international post–Kyoto agreement is also likely to expand the list of GHGs covered). Emissions of GHGs are measured in terms of CO₂–equivalents (CO₂e), which account for the relative global warming potential of each gas compared to CO₂.

Emissions caps, emissions allowances and compliance

The bill lays out annual caps on emissions allowances (or permits) to be allocated to covered entities, which progressively decrease until 2050, at which time the allowance becomes constant.⁵ The penalty for non–compliance is set at twice the fair market value of emissions allowances during the year for which the emission allowances were due.⁶ Emissions allowances may be banked, and up to 15 per cent of an entity’s compliance obligations can be borrowed from future years up to five years ahead. Borrowed allowances must be repaid with interest.⁷

International trading is allowed for qualifying international programs. Such programs must be government–run, and be at least as stringent as the US scheme.⁸

Domestic and international credit offsets may also be used for compliance, up to a maximum limit of two billion tonnes CO₂e annually.⁹ Such offsets must be approved by the EPA.¹⁰ The scope of the type of offsets that may be used includes emission reductions from reduced deforestation, subject to certain requirements.¹¹

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5. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 721—Emissions allowances.
 6. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 723—Penalty for noncompliance.
 7. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 725—Banking and borrowing.
 8. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 728—International emission allowances.
 9. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 722—Prohibition of excess emissions.
 10. ACESA, Title VII—Global warming pollution reduction program, Part D—Offsets.
 11. ACESA, Title VII—Global warming pollution reduction program, Part D—Offsets, Section 743—International offset credits, Paragraph (e) Offsets from reduced deforestation.

Covered sectors

Sources of GHGs covered under the scheme include¹²:

- any electricity source
- stationary industrial sources, some of which are subject to a liability threshold of 25 000 tonnes CO₂e in annual emissions, as follows:
 - not subject to the threshold are producers of adipic acid, aluminium, ammonia, cement, hydrochlorofluorocarbons, lime, nitric acid, refined petroleum products, phosphoric acid, silicon carbide, soda ash, titanium dioxide, or coal–based liquid or gaseous fuel
 - subject to the threshold are manufacturers or importers of industrial gases (fossil fuel based CO₂, N₂O, PFCs, SF₆, any other fluorinated gas except NF₃); NF₃ emitters; chemical or petrochemical producers; sources involved in ethanol production, ferroalloy production, fluorinated gas production, food processing, glass production, hydrogen production, iron and steel production, lead production, pulp and paper manufacturing or zinc production; and fossil fuel combustion devices (such as boilers)
- any producer or importer of petroleum or coal–based fuel, petroleum coke, or liquefied natural gas where the fuel combusted would produce 25 000 tonnes CO₂e emissions or more annually
- any geological sequestration site, and
- natural gas distributors that deliver more than 460 million cubic feet of natural gas per year to customers who are not covered entities.

Industrial sources (other than manufacturers and importers of industrial gases and NF₃ emitters) are not liable until 2014. Natural gas distribution companies are liable from 2016. The remaining covered entities are liable from commencement of the scheme in 2012.¹³

Exempt from the scheme are emissions from algae–based fuels that are offset by CO₂ sequestration during algae growth; fugitive emissions, except where they can be determined reliably; and exported fuels or GHGs. The agriculture sector is not specifically covered by the scheme.

Permit price regulation

The majority of permits will initially be allocated free of charge to assist industry and consumers and support investment in clean energy. Most of these free permit allocations will

12. ACESA, Title VII—Global warming pollution reduction program, Section 700—Definitions.

13. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 722—Prohibition of excess emissions.

then be available for trade on the market. The assistance measures generally phase out from 2025:

Under [the American Clean Energy and Security Act] ACES, approximately 80% of allowances are distributed without charge during the early years of the program to ease the transition to a clean energy economy. This transition period starts to phase out after 2025. By 2031, about 70% of the allowances are auctioned.¹⁴

Permits sold at auction are subject to a minimum price of US\$10 in 2012. This minimum price increases by five per cent plus inflation each year (representing a ‘real’ price increase of five per cent).¹⁵

A strategic reserve is to be established as a cost–containment measure. Each year from 2012 to 2050, a small percentage of the total permit pool will be set aside in the strategic reserve. The amount transferred to the strategic reserve will be one per cent of the annual permit pool from 2012 to 2019, two per cent from 2020 to 2029, and three per cent from 2030 to 2050. This effectively lowers the amount of permits available in the pool for regular auctioning. The strategic reserve will also be supplemented with permits not sold at auction.

Permits in the strategic reserve will be available for auction quarterly to covered entities only. These permits will be subject to minimum prices, starting at twice the modelled market price for 2012 and increasing by five per cent plus inflation for the next two years. For subsequent years (from 2015), the minimum price will be 60 per cent above the average market price over the three years previous. The number of permits sold from the strategic reserve will be subject to maximum limits of five per cent of the total emissions allowance for each year from 2012 to 2016, increasing to 10 per cent from 2017.¹⁶

Emissions reductions from reduced deforestation

In addition to the ability to generate offset credits through reduced deforestation activities in eligible countries, the bill provides for supplemental emissions reductions through reduced deforestation. It calls for the establishment of a program to reduce emissions from deforestation in developing countries. The objectives of the program are to:

- (1) achieve supplemental emissions reductions of at least 720,000,000 tons of carbon dioxide equivalent in 2020, a cumulative amount of at least 6,000,000,000 tons of carbon

14. Committee on Energy and Commerce, *The American Clean Energy and Security Act (H.R. 2454)*, Committee summary of the bill as reported, US House of Representatives, 2 June 2009, p. 4, viewed 11 June 2009,

http://energycommerce.house.gov/Press_111/20090602/hr2454_reported_summary.pdf

15. ACESA, Title VII—Global warming pollution reduction program, Part H—Disposition of allowances, Section 791—Auction procedures.

16. ACESA, Title VII—Global warming pollution reduction program, Part C—Program rules, Section 726—Strategic reserve.

dioxide equivalent by December 31, 2025, and additional supplemental emissions reductions in subsequent years;

(2) build capacity to reduce deforestation in developing countries experiencing deforestation, including preparing developing countries to participate in international markets for international offset credits for reduced emissions from deforestation; and

(3) preserve existing forest carbon stocks in countries where such forest carbon may be vulnerable to international leakage, particularly in developing countries with largely intact native forests.¹⁷

Assistance to emissions–intensive trade–exposed industries

As this is one of the more contentious issues surrounding the introduction of an ETS, the issue of assistance to emissions–intensive and trade–exposed (EITE) industries is discussed here in some detail.

Subject to maximum limits on free allowances as a percentage of the total permit pool, the bill allows for up to 100 per cent compensation of all direct and indirect costs to industries that are assessed as EITE, for as long as less than 70 per cent of global output in the relevant sector is produced in countries with similar emissions constraints (satisfying certain criteria). That is, EITE industries will receive up to 100 per cent free permit allocation, and will furthermore be compensated for indirect costs such as higher energy prices.

The scheme is to commence in 2012, with industrial sources not becoming liable until 2014. The bill provides for up to 100 per cent compensation to continue until 2025, at which time it is ramped down by 10 per cent each year until it reduces to zero in 2035. **However:**

- there must be a Presidential determination by 30 June 2022 and every four years thereafter on whether more than 70 per cent of global output in eligible EITE sectors occurs in countries subject to emissions constraints that meet certain criteria. If the President determines that less than 70 per cent of global output is subject to such constraints, then the 100 per cent compensation continues. Otherwise, it declines by 10 per cent each year¹⁸, and
- the free permit allocations are subject to maximum limits for each year. The free allowance cannot exceed two per cent of the nation–wide emissions cap from 2012 to

17. ACESA, Title VII—Global warming pollution reduction program, Part E—Supplemental emissions reductions from reduced deforestation, Section 753—Supplemental emissions reductions through reduced deforestation; international leakage of forest carbon refers to the possibility that forests may be harvested from developing countries for products to be exported to countries where emissions constraints are in place (which places a cost on the harvest of forests within those countries, or an incentive to maintain forests for their capacity to store carbon).

18. The bill allows for the President to alter the rate and timing of decline, but based on the provisions it appears that the commencement year of this decline is unlikely to be before 2025.

2013 (during which industrial sources are not directly covered, but are compensated for indirect costs). This limit becomes 15 per cent of the cap in 2014, and then reduces from 15 per cent each year thereafter by the rate at which the cap declines (by 1.75 per cent per year from 2015 to 2020, then by 2.5 per cent per year from 2021 to 2025).

This means that, subject to the maximum allowance, industries with proportionally high import and/or export values are potentially fully shielded from the scheme until the majority (greater than 70 per cent) of global production in that sector is subject to emissions pricing.

Sections of the bill relating to EITE assistance

The details of the EITE assistance are laid out in the relevant sections of the bill as follows.

Section 722 (in Part C – Program rules under Title VII), paragraph (c) states that industrial stationary sources will become liable for their emissions from 2014.

Section 782 (in Part H – Disposition of allowances under Title VII) sets a limit on the free allowances to EITE industries:

- (e) Trade–Vulnerable Industries—The Administrator shall allocate emission allowances to energy –intensive, trade–exposed entities, to be distributed in accordance with part F, in the following amounts:
 - (1) For vintage years 2012 and 2013, up to 2.0 percent of the emission allowances established for each year under section 721(a).
 - (2) For vintage years 2014, up to 15 percent of the emission allowances established for that year under section 721(a).
 - (3) For vintage years 2015 through 2025, the maximum number of allowances that shall be distributed shall decline by the same amount that the annual reduction target set forth in section 702 declines (which is 1.75 percentage points annually for 2015 through 2020, and 2.5 percentage points annually from 2021 through 2025).
 - (4) For vintage years 2026 through 2050, the maximum number of allowances that shall be distributed shall decline by the same amount that the annual reduction target set forth in section 702 declines (which is 2.5 percentage points annually for 2026 through 2030, and 1.55 percentage points annually from 2031 through 2050) and shall be multiplied by a factor, which shall be 90 percent in 2026 and decline 10 percentage points a year until it reaches zero, unless the President sets a different factor under section 767(c)(3)(A), that shall not exceed 100 percent.¹⁹

Section 765 (in Part F – Ensuring real reductions in industrial emissions under Title IV) states that for vintage years 2012 and 2013, the allowance rebate will be allocated to cover 100 per cent of an entity’s ‘indirect carbon factor’ (see below for definition). From 2014 to

19. ACESA, Title VII—Global warming pollution reduction program, Part H—Disposition of allowances, Section 782: Allocation of emission allowances.

2025, the rebate will be allocated to cover 100 per cent of an entity’s direct and indirect carbon factors. From 2026 onwards, except as modified by the President under Section 767 (see below), the allowance rebate will be reduced by 10 per cent each year, i.e. covering 90 per cent in 2026, 80 per cent in 2027, until there is zero compensation from 2035 onwards. However, the maximum allowance to EITE industries is limited under Section 782. This is stated in Section 765 as:

(c) TOTAL MAXIMUM DISTRIBUTION.—Notwithstanding subsections (a) and (b), the Administrator shall not distribute more allowances for any vintage year pursuant to this section than are allocated for use under this part pursuant to section 782 for that vintage year. For any vintage year for which the total emission allowance rebates calculated pursuant to this section exceed the number of allowances allocated pursuant to section 782 the Administrator shall reduce each entity’s distribution on a pro rata basis so that the total distribution under this section equals the number of allowances allocated under section 782.²⁰

Notes/definitions:

- the *direct carbon factor* is the average output of an entity for the previous two years multiplied by the average direct greenhouse gas emissions per unit of output for all covered entities in the sector
- the *indirect carbon factor* is the average output of an entity over the previous two years multiplied by both the electricity emissions intensity factor and the electricity efficiency factor. This accounts for indirect costs experienced by EITE industries due to costs passed on by electricity suppliers, and
- the *output* of an entity is the total tonnage or other standard unit of production produced by an entity in an industrial sector.

Section 767 (Subpart 3 of Part F – Ensuring real reductions in industrial emissions under Title IV) requires the President to assess the effectiveness of the emission allowance rebates in mitigating carbon leakage by 1 January 2018. By 30 June 2022 and every four years thereafter, the President must determine, for each eligible industrial sector, whether more than 70 per cent of global output for that sector occurs in countries that are subject to emissions constraints at least as stringent as those of the US or have imposed costs to those industries that amount to at least 60 per cent of the cost imposed by the ETS in the US. Specifically, they must meet at least one of the following criteria:

- (1) The country is a party to an international agreement to which the United States is a party that includes a nationally enforceable greenhouse gas emissions reduction

20. ACESA, Title IV—Transitioning to a clean energy economy, Part F—Ensuring real reductions in industrial emissions, Subpart 1—Emission allowance rebate program, Section 765—Distribution of emission allowance rebates.

commitment for that country that is at least as stringent as that of the United States.

- (2) The country is a party to a multilateral or bilateral emission reduction agreement for that sector to which the United States is a party.
- (3) The country has an annual energy or greenhouse gas intensity, as described in section 764(b)(2)(A)(i), for the sector that is equal to or less than the energy or greenhouse gas intensity for such sector in the United States in the most recent calendar year for which data are available.
- (4) The country has implemented policies, including sectoral caps, export tariffs, production fees, electricity generation regulations, or greenhouse gas emissions fees, that individually or collectively impose an incremental increase on the cost of production associated with greenhouse gas emissions from the sector that is at least 60 percent of the cost of complying with this title in the United States for such sector, averaged over a two-year period.²¹

If the President determines that less than 70 per cent of global output for a sector is produced in countries that meet one or more of the above criteria (i.e. the determination is negative), then the emissions allowance rebate program may continue in full or at modified rate, and/or an international reserve allowance program may be implemented (but not before 2025). The international reserve allowance effectively makes importers of products manufactured by EITE industries liable for embodied emissions (emissions during their production offshore).

If the President determines that more than 70 per cent of global output is produced in such countries, then Section 765 provides that if the decline in emissions allowance rebate has been delayed under a previous (negative) Presidential determination, then the decline will commence in the year following the new (positive) determination.

Section 764 (Subpart 1 of Part F – Ensuring real reductions in industrial emissions under Title IV) lays out the criteria for industrial sectors to be assessed as eligible for the emissions allowance rebates, as follows:

(A) **ELIGIBILITY CRITERIA**- An owner or operator of an entity shall be eligible to receive emission allowance rebates under this subpart if such entity is in an industrial sector that is included in a six-digit classification of the NAICS that meets the criteria in both clauses (i) and (ii), or the criteria in clause (iii).

(i) **ENERGY OR GREENHOUSE GAS INTENSITY**- As determined by the Administrator, the industrial sector had--

(I) an energy intensity of at least 5 percent, calculated by dividing the cost of purchased electricity and fuel costs of the sector by the value of the shipments of the sector, based on data described in subparagraph (E); or

21. ACESA, Title IV—Transitioning to a clean energy economy, Part F—Ensuring real reductions in industrial emissions, Subpart 3—Presidential determination, Section 767—Presidential reports and determinations.

(II) a greenhouse gas intensity of at least 5 percent, calculated by dividing--

(aa) the number 20 multiplied by the number of tons of carbon dioxide equivalent greenhouse gas emissions (including direct emissions from fuel combustion, process emissions, and indirect emissions from the generation of electricity used to produce the output of the sector) of the sector; by

(bb) the value of the shipments of the sector, based on data described in subparagraph (E).

(ii) TRADE INTENSITY- As determined by the Administrator, the industrial sector had a trade intensity of at least 15 percent, calculated by dividing the value of the total imports and exports of such sector by the value of the shipments plus the value of imports of such sector, based on data described in subparagraph (E).

(iii) VERY HIGH ENERGY OR GREENHOUSE GAS INTENSITY- As determined by the Administrator, the industrial sector had an energy or greenhouse gas intensity, as calculated under clause (i)(I) or (II), of at least 20 percent.²²

The petroleum refining sector is specifically excluded from eligibility (but receives compensation separately—see below), and there are specific provisions regarding aggregation of data for metal production sectors. Subparagraph (E) referred to above describes the data sources to be used for the assessment, including electricity and fuel costs, value of shipments and value of imports and exports from 2004 to 2006 where available.

Other transitional assistance

Domestic petroleum refiners are to be allocated emissions allowances (that is, free permits) amounting to two per cent of the total annual permit pool from 2014 to 2026.²³

The bill provides other assistance to alleviate the impact of the increased costs to consumers and communities and encourage development of clean energy technology:

For the period from 2012 through 2025, 55% of the allowances will be used to protect consumers from energy price increases; 19% will be used to assist trade-vulnerable and other industries make the transition to a clean energy economy; 13% will be used to support investments in clean energy and energy efficiency; and 10% will be used for domestic adaptation, worker assistance and training, prevention of deforestation, and international adaptation. The remainder (3% of allowances) will be used to help ensure that ACES is budget neutral.

22. ACESA, Title IV—Transitioning to a clean energy economy, Part F—Ensuring real reductions in industrial emissions, Subpart 1—Emission allowance rebate program, Section 764—Eligible industrial sectors.

23. ACESA, Title VII—Global warming pollution reduction program, Part H—Disposition of allowances, Section 782: Allocation of emission allowances.

From the period from 2026 through 2050, up to 58% of the allowances will be used to protect consumers; 19% will be used for domestic adaptation, worker assistance and training, prevention of deforestation, and international adaptation; 12% will be used to support investments in clean energy and energy efficiency; 7% will be used to ensure budget neutrality; and at least 4% will be used to assist trade–vulnerable and other industries.²⁴

Specifically, in addition to the industry assistance noted in the previous section, emissions allowances will be allocated as follows²⁵:

- the electricity sector will receive nearly 44 per cent of the allowances in 2012 and 2013, decreasing in the following years to 35 per cent from 2016 through 2025, and being phased out from 2026 to 2030. This will cover 90 per cent of current utility emissions. These allowances (mostly to local electricity distribution companies) must be used to protect customers from electricity price increases
- local natural gas distribution companies will receive nine per cent of allowances, phasing out from 2026 to 2030
- for the benefit of home heating and propane consumers, nearly 1.9 per cent of allowances will be allocated initially, decreasing to 1.5 per cent from 2016 through 2025, and phasing out from 2026 to 2030
- low–income consumers will receive proceeds from the auction of 15 per cent of allowances for each year from 2012
- for deployment of carbon capture and storage technologies, two per cent of allowances from 2014 through 2017 and five per cent in subsequent years will be allocated to electricity utilities
- for investments in renewable energy and energy efficiency measures, states will receive 10 per cent of allowances from 2012 through 2015, 7.5 per cent for 2016–17, 6.5 per cent for 2018–21, and five per cent thereafter (until 2050)
- for investments in advanced automobile technology, three per cent of allowances will be allocated from 2012 through 2017 and one per cent from 2018 through 2025
- for Clean Energy Innovation Centers, one per cent of allowances will be allocated from 2012 to 2050

24. Committee on Energy and Commerce, *The American Clean Energy and Security Act (H.R. 2454)*, p. 4.

25. HA Waxman and EJ Markey, *Proposed allowance allocation*, 14 May 2009, viewed 11 June 2009, http://energycommerce.house.gov/Press_111/20090515/allowanceallocation.pdf; ACESA, Title VII—Global warming pollution reduction program, Part H—Disposition of allowances, Section 782: Allocation of emission allowances.

- for prevention of tropical deforestation and building capacity to generate international deforestation avoidance offsets, five per cent of allowances will be allocated from 2012 through 2025, three per cent from 2026 through 2030, and two per cent thereafter
- for domestic adaptation purposes, two per cent of allowances will be allocated from 2012 through 2021, four per cent from 2022 through 2026, and eight per cent thereafter
- for international adaptation and clean technology transfer, two per cent of allowances from 2012 through 2021, four per cent from 2022 through 2026, and eight per cent thereafter, and
- for worker assistance and job training, 0.5 per cent of allowances from 2012 through 2021, and one per cent thereafter.

Clean energy

Renewable electricity and energy efficiency targets

The bill combines the Renewable Electricity Standard (RES) and Energy Efficiency Resource Standard (EERS) into one standard. This standard requires retail electricity suppliers to source a certain percentage of their electricity generation from renewable resources and electricity savings. The combined renewable electricity and savings must amount to six per cent in 2012, increasing to 20 per cent by 2020. Up to one-quarter of this target may be met through electricity savings (efficiency measures), but this proportion may be increased on petition to the state governor. Electricity savings may be achieved through direct efficiency measures or may be purchase of savings achieved by other suppliers, distribution companies or other third party providers.

Carbon capture and storage

The bill calls for a comprehensive strategy to address legal and regulatory barriers to commercial-scale deployment of carbon capture and storage (CCS), and establishes a US\$1 billion per year program for demonstration projects to accelerate commercial deployment of CCS. It also amends the Clean Air Act to:

- allow an incentive program to be established that would distribute allowances to support CCS, and
- establish performance standards for new coal-fired power plants.

Clean transportation

The bill calls for electric vehicle infrastructure to be considered under utility development plans, and provides financial assistance for regional deployment and integration of grid-connected electric vehicles. The assistance would fund such measures as subsidising electric vehicle purchases, deployment of electric charging stations or battery exchange locations, and

integration of smart grid technology with electric vehicles. There is also provision for financial assistance for retooling car manufacturing factories to manufacture electric vehicles.

Smart grids

Smart grids help to integrate distributed, intermittent and peak energy sources into the grid more efficiently, including solar and wind power, by monitoring electricity supply and demand. Smart meters installed in households allow real-time feedback and analysis of energy use within homes to help householders monitor and adjust their energy use. The provision of this information through smart metering has been shown to alter behaviour to reduce household energy use, especially during peak demand. The bill supports development of a ‘smart grid’ through inclusion of smart grid capability in energy ratings and rebates, and establishment of a national program to reduce peak electricity demand. It also establishes a federal policy on electricity grid planning that provides for the incorporation of intermittent renewable energy sources and electricity storage.

Clean energy innovation centres

The bill calls for the establishment of eight regional Clean Energy Innovation Centres to support development and commercialisation of clean energy technologies.

Energy efficiency

Energy efficiency of building and appliances

The bill contains a number of measures to improve energy efficiency of buildings and appliances. The bill:

- calls for energy efficiency standards in building codes to be increased by 30 per cent in 2010 and 50 per cent in 2016
- establishes a program to support retrofitting of buildings to improve their energy efficiency, providing up to 50 per cent of the costs of such retrofits
- provides for rebates of up to US\$7500 for low-income owners of pre-1976 manufactured homes to purchase new energy efficient manufactured homes
- calls for buildings to be subject to energy performance assessment and labelling, and
- revises efficiency standards for lighting fixtures and appliances.

Transport efficiency

The bill calls for federal and state light-vehicle fuel economy standards to be harmonised, and for the EPA to set standards for GHG emissions from new heavy-duty vehicles and non-road vehicles and engines.

It also requires states to establish targets for GHG emissions reductions from the transport sector, requiring plans to be submitted to meet these targets for areas with populations of more than 200 000.

Industrial efficiency

The bill supports improvements in efficiency in industrial plants, through setting of standards and financial incentives.

Current status of bill and next steps

The bill passed a major hurdle when it was approved by the Energy and Commerce Committee on 21 May 2009.²⁶ The bill must still be approved by eight other committees that share jurisdiction over the legislation. However, commentators have suggested that these committees will act quickly to approve the bill.²⁷ This would clear the way for the bill to be debated in the House possibly before the 4 July recess. After passage through the House, the bill must then be passed by the Senate, where there is expected to be less support for the bill. Opponents have expressed concern that it imposes too much of a burden on industry, that consumers would suffer under higher energy prices in the midst of a recession, and that it would lead to job losses.²⁸

Comparison with the Carbon Pollution Reduction Scheme

As detailed above, in addition to an ETS, the Waxman–Markey bill contains initiatives on clean energy and energy efficiency, as well as domestic and international adaptation and mitigation measures. In contrast, the proposed Australian CPRS is focussed on establishing an ETS. However, the Australian Government has undertaken other measures on clean energy and energy efficiency along similar lines to the measures contained in the Waxman–

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26. Committee on Energy and Commerce, *Energy and Commerce Committee passes comprehensive clean energy legislation*, 21 May 2009, viewed 3 June 2009, http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1630:energy-and-commerce-committee-passes-comprehensive-clean-energy-legislation&catid=122:media-advisories&Itemid=55
 27. D Samuelsohn, 'Dems weight climate floor debate before July 4', *New York Times*, 2 June 2009, viewed 3 June 2009, <http://www.nytimes.com/cwire/2009/06/02/02climatewire-dems-weigh-climate-floor-debate-before-july-17063.html>
 28. JM Broder, 'Climate bill clears hurdle, but others remain', *New York Times*, 21 May 2009, viewed 12 June 2009, <http://www.nytimes.com/2009/05/22/us/politics/22climate.html>; J Eilperin, 'House climate bill aims to please environmental and business interests', *Washington Post*, 1 April 2009, viewed 12 June 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/31/AR2009033103683.html>

Markey bill.²⁹ Australia has also been working with regional partners and in international negotiations to develop and participate in international abatement programs, especially relating to reduced emissions from deforestation and forest degradation, and development of carbon capture and storage.

The following table compares the main features of the ETS proposals in the Waxman–Markey bill and the CPRS.

Feature	Waxman–Markey ETS	CPRS
Timing	To commence 2012, with phased in coverage of industrial sources (2014) and natural gas distribution companies (2016).	To commence July 2011, with possible inclusion of agriculture in 2015.
Economy wide emissions reduction targets	<ul style="list-style-type: none"> - 3% below 2005 levels by 2012 - 20% below 2005 levels by 2020 (21% below 2000 levels by 2020) - 42% below 2005 levels by 2030 - 83% below 2005 levels by 2050 (83% below 2000 levels by 2050) Covered sources are subject to independent targets (as above except 2020 target is 17% below 2005 levels).	<ul style="list-style-type: none"> - 5–15% or 25% below 2000 levels by 2020 (higher targets are conditional on an international agreement satisfying certain criteria) - 60% below 2000 levels by 2050 Covered sources are not subject to independent targets.
Permit price regulation (one permit represents one tonne CO ₂ e)	Permits are subject to minimum permit price of US\$10 in 2012, rising by 5% real growth each year thereafter. Auctions of permits from the strategic reserve are subject to higher minimum prices, starting at twice the 2012 modelled market price and increasing by 5% real growth in the following two years, then maintained at 60% above the market price for subsequent years.	Permits are subject to fixed price of AU\$10 in first year, and capped at AU\$40 + 5% real growth per year (from 2010–11) for the next four years.

29. See J Styles and A Talberg, *Budget 2009–10: Climate change and energy*, Budget Review 2009–10, Parliamentary Library, Canberra, 2009, viewed 11 June 2009, http://www.aph.gov.au/Library/pubs/RP/BudgetReview2009-10/Climate_Energy.htm

Feature	Waxman–Markey ETS	CPRS
Greenhouse gases covered	All GHGs controlled under the Kyoto Protocol, plus: <ul style="list-style-type: none"> - Any other PFC - HFCs from a chemical manufacturing process at a stationary industrial source - Any other GHG designated by the EPA Administrator 	All GHGs controlled under the Kyoto Protocol.
Sectors/industries covered (those marked with an asterisk cover facilities that emit more than 25 000 tonnes CO ₂ e per year)	<ul style="list-style-type: none"> - Electricity generators - Fuel producers and importers* - Industrial gas manufacturers* - Fossil fuel fired combustion devices* - Geological sequestration sites - Nitrogen trifluoride sources* - Industrial sources (from 2014)^a - Natural gas distributors (from 2016)^b 	<ul style="list-style-type: none"> - Fuel producers and importers - All major industrial sectors* - Synthetic gas importers and producers* - Landfill operations*^c - Reforestation on opt–in basis for credits - Possibly agriculture (from 2015)
Emissions caps	Specified from commencement to 2050, at which time caps become constant.	To be specified five years in advance, with ‘gateways’ providing guidance to caps for up to a further ten years.
Borrowing	Up to 15% of compliance obligations may be borrowed from the next 5 years’ entitlement.	Up to 5% of compliance obligations may be borrowed from the next year’s entitlement.
Penalties	Twice market value for the compliance year.	110% of market value for the compliance year.
Linkages with international emissions trading schemes	Allowed for approved programs that are government–run and at least as stringent as the US ETS.	Not allowed at present.
Offsets	Domestic and international offsets allowed up to a maximum of 2 billion tonnes CO ₂ e per year (with each covered entity subject to proportionate limits). Offset projects must be approved by the EPA.	Domestic offsets not allowed at present (though credits can be generated through reforestation projects). International offsets/credits may be generated through the Kyoto Protocol’s Clean Development Mechanism and Joint Implementation projects.
EITE assistance		

Feature	Waxman–Markey ETS	CPRS
- Proportion of EITE permits	Maximum 15% of total permit pool initially, when industrial sources become liable in 2014, decreasing thereafter.	Approximately 27% of total permit pool initially (projected to increase to up to 40% by 2020).
- Rate of EITE assistance	Subject to maximum limit on proportion of permits, up to 100% of direct and indirect costs.	For highest emissions–intensive category, 94.5% of direct and indirect costs. For lower emissions–intensive category, 66% of direct and indirect costs.
- Rate of decline in EITE assistance	Maximum limit on proportion of permits to decline by 1.75% per year for six years, then by 2.5% per year for the next five years.	Rate of assistance declines by 1.3% per year. In addition, initial 5% boost (‘global recession buffer’) ceases after five years.
- EITE eligibility	<p>Eligible sectors must meet either the energy intensity or emissions intensity criteria, as well as the trade intensity criteria:</p> <ul style="list-style-type: none"> - Energy intensity (electricity and fuel costs per dollar of revenue) of at least 5%; or - Emissions intensity of at least 2500 tonnes CO₂e per million dollars of revenue; and - Trade intensity (value of imports and exports divided by value of domestic production plus imports) of at least 15% <p>The petroleum refining sector is specifically excluded from eligibility but receives compensation amounting to 2% of the total permit pool from 2014 to 2026.</p>	<p>Eligible sectors must meet the emissions intensity and trade intensity criteria as follows:</p> <ul style="list-style-type: none"> - For higher rate of assistance, emissions intensity above 2000 tonnes CO₂e per million dollars of revenue or above 6000 tonnes CO₂e per million dollars value added; or - For lower rate of assistance, emissions intensity above 1000 tonnes CO₂e per million dollars of revenue or above 3000 tonnes CO₂e per million dollars value added; and - Trade intensity (value of imports and exports divided by value of domestic production) of at least 10%
- Continuation or phase–out conditions for EITE assistance	EITE assistance is subject to a Presidential determination in 2022 and every four years thereafter. If the President determines that less than 70% of global output is subject to emissions constraints that meet certain criteria (similar constraints to the US ETS), then the 100% compensation continues. Otherwise, it declines by 10% each year.	EITE assistance will be phased out if an international agreement emerges that places similar constraints on emissions. Five years advance notice of any changes will be given.

Feature	Waxman–Markey ETS	CPRS
Other assistance	Support for: <ul style="list-style-type: none"> - electricity and natural gas distributors to alleviate price increases for consumers - green jobs and retraining - low-income consumers - energy efficiency and clean energy investments - deployment of clean energy technologies in developing countries - climate change adaptation measures 	<ul style="list-style-type: none"> - Assistance to coal-fired power generators - Fund to ease transition costs for businesses, community sector organisations, workers, regions and communities - Reduction in fuel excise - Assistance to low and middle income households, pensioners, carers and social security benefit recipients

^a Most industrial sources are not subject to the 25 000 tCO₂e liability threshold in the Waxman bill. Those that are include chemical and petrochemical manufacturers and facilities involved in ethanol production, ferroalloy production, fluorinated gas production, food processing, glass production, hydrogen production, iron and steel production, lead production, pulp and paper manufacturing, and zinc production (see Section 700(F) and (G)).

^b Natural gas distributors are covered under the Waxman bill if they deliver more than 460 million cubic feet of natural gas to customers that are not covered entities.

^c Landfill facilities are covered under the CPRS if they emit more than 10 000 tCO₂e per year and are within a prescribed distance of another landfill facility that accepts the same classification of waste and which itself emits at least 25 000 tCO₂e per year.

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