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DOE FY2014 Congressional Budget Request for EERE

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Overview & Background

- Highlights
- Administration's Goals
- FY2014 EERE Emphasis
- Funding Calculation References
- New Thematic Grouping of Accounts

Highlights

- FY2013 final estimates were not available, so FY2012 is used as baseline for all comparisons with FY2014 request figures:
- DOE total request up $1.75 B (7%)
- EERE up $995 M (56%)
- Largest EERE program increases are for vehicles and manufacturing
- Electric (OE) up $33 M (24%)
- Offsets: oil and natural gas tax subsidies

Administration's Goals

- Reduce oil imports 1/2 by 2020
- Lead the world in clean energy technologies
  - Double renewable energy production by 2020
  - Double energy productivity by 2030 (Race to the Top)
  - Non-residential buildings 20% more efficient by 2020
  - 80% clean energy power generation by 2035 (includes nuclear and efficient gas)
  - Cut greenhouse gases 17% below 2005 level by 2020

FY2014 EERE Emphasis

Entire EERE effort: Transformation to Clean Energy Economy

- International Competitiveness (Manufacturing & Jobs)
- Climate Change (Reduced Carbon)
- Oil Imports (EVs & Biofuels)

Funding Calculation References

- FY2013 final estimates were not available, so FY2012 is used as the baseline for all comparisons with FY2014 request figures
- All funding changes shown in the presentation follow those in the DOE request.
- The differences are calculated between the FY2014 request and the FY2012 appropriation.
- For simplicity, many figures are rounded-off.
- DOE uses a new thematic grouping of major program accounts.

New Thematic Grouping of Accounts

- Current appropriation accounts are grouped by renewable energy, energy efficiency, grants, and management.
- The request preserves the major program accounts (e.g. “Solar Energy,” “Building Technologies,” etc).
- But—those accounts are now grouped by four themes:

1. Sustainable Transportation
2. Energy Efficiency
3. Renewable Electricity Generation
4. Corporate

Key Funding Changes, by Theme

- Sustainable Transportation
- Energy Efficiency
- Renewable Electricity Generation
- Corporate

Sustainable Transportation (FY2014-FY2012 difference)

- TOTAL, + $340 M (55%)
  - Vehicles, + $254 M (79%)
    - Electric Vehicle (EV) Grand Challenge
  - Bioenergy (Biomass/Biorefinery), + $87 M (45%)
  - Hydrogen/Fuel Cells, – $1 M (1%)

Energy Efficiency (FY2014-FY2012 difference)

- TOTAL, + $464 M (96%)
  - Manufacturing, + $252 M (224%)
  - Weatherization/IG, + $120 M (94%)
    - WAP, + $116 M (171%)
  - Buildings, + $85 M (40%)
  - Federal Energy Management Program, (FEMP) + $6 M (20%)

Renewable Electricity Generation (FY2014-FY2012 difference)

- TOTAL, + $144 M (31%)
  - Solar, + $72 M (25%)
  - Wind, + $52 M (57%)
  - Geothermal, + $23 M (62%)
  - Water, - $3 M (-5%)

Corporate (FY2014-FY2012 difference)

- TOTAL, + $51 M (23%)
  - Facilities, + $20 M (75%)
  - Program Direction, + $20 M (12%)
  - Strategic Programs, + $11 M (44%)

Key Funding Changes, by Program

- Major Program Increases
- Small Program Decreases

Major Program Increases (FY2014-FY2012 difference)

- Vehicles +$254 M (79%)
- Manufacturing + $252 M (224%)
- Weatherization + $116 M (171%)
- Bioenergy + $88 M (45%)
- Buildings + $85 M (40%)
- Solar + $72 M (25%)
- Wind + $52 M (57%)
- Geothermal + $23 M (62%)

Small Program Decreases (FY2014-FY2012 difference)

- Water Power - $3 M (-5%)
- Hydrogen/Fuel Cells - $1 M (-1%)

Program Highlights: Goals & Funding

- Vehicles
- Manufacturing
- Bioenergy
- Buildings
- Solar
- Wind
- Innovation Hubs

Vehicles Program, Highlights (FY2014-FY2012 difference)

- Goals & Objectives
  - Parity for Plug-in EV affordability & convenience by 2022
  - Cut 2008 battery production cost 70% by 2015, 88% by 2022
  - Grid Integration Initiative
  - 1.8 million barrels per day (16%) cut in oil use trend by 2020
  - 61.6 miles per gallon (mpg) fuel economy for cars by 2025
  - 50% increase in heavy duty truck fuel economy by 2015

- $254 M (79%) increase, esp. for EV Grand Challenge:
  - + $123 M (104%) for Batteries & Electric Drives:
    [advanced batteries, power electronics, charging stations]
  - + 87 M (222%) for Outreach and Deployment
  - + 23 M (48%) for Vehicle Testing
  - + 19 M (46%) for Materials Technology
  - Similar to FY2013 request, but larger $ amount

Manufacturing Program, Highlights (FY2014-FY2012 difference)

- Goals & Objectives
  - Anchor for new (March 2013) Clean Energy Manufacturing Initiative
  - Improve competitiveness in global markets for products (e.g. solar PV modules, LED lights, batteries, wind turbine blades)
  - Increase competitiveness by raising industrial energy productivity (Race to the Top)
  - 50% energy savings through advanced materials & processes
  - 40 gw (million kilowatts) of combined heat and power by 2020
  - Help leading companies cut energy intensity by 25% over 10 years

- $252 M (224%) increase:
  - + $183 M (528%) for Advanced Manufacturing R&D Facilities:

    [which include Energy Manufacturing Innovation Institutes, Critical Materials Hub, Manufacturing Demonstration Facilities]
  - + $60 M (99%) for Next Generation R&D Projects
  - Compared to FY2013 request—larger overall $ amount; including much more for Facilities and much less for Projects

Bioenergy Program, Highlights (FY2014-FY2012 difference)

Goals & Objectives

- $3 per gallon of gasoline equivalent (gge) for “drop-in” fuels by 2017
- $3/gge for algal biomass productivity by 2022

Bioenergy, + $87 M (45%)

- Conversion Technologies, + $39 M (38%) for bio-oil, algae dewatering
- Integrated Biorefineries, + $35 M (81%) for pilot- and demonstration-scale biorefinery plants
- Feedstocks, + $6 M for conversion to solid pellets or “green crude” bio-oil
- Similar to FY2013 request, but more $ emphasis on Conversion and less on other subprograms

Buildings Program, Highlights (FY2014-FY2012 difference)

Goals & Objectives

- 50% energy use reduction for new buildings by 2030

Buildings, + $85 M (40%)

- + $71 M (115%) for Emerging Technologies, R&D on sensors, controls, and grid integration
- + $15 M (23%) to accelerate equipment standards & building codes
- Building Design Innovation Hub extended again
- Compared to FY2013 request, much more for Emerging Technologies and less for Standards
- Note: Major long-term barriers (Cong. Staff, see CRS report R40670 by Paul Parfomak)

Solar Program, Highlights (FY2014-FY2012 difference)

Goals & Objectives

- 6 cents/kilowatt-hour (75% cut) for energy cost of utility-scale photovoltaic (PV) plants by 2020 (SunShot Initiative)
- Installed PV capacity cost targets of $1 M/megawatt-hour(mwh) for utility-scale ($1.25/commercial, $1.50/residential)
- Concentrated solar power (CSP) installed cost of $3.5 M/mwh (includes storage), equivalent to 6 cents/kwh
- Grid Integration Initiative

Solar, + $72 M (25%)

- + $45 M (100%) for CSP
- + $29 M (91%) for Balance of Systems
- + $16 M (34%) for Systems Integration (SI)
- - $34 M (-41%) for Innovative Manufacturing (IM)
- Compared to FY2013 request: more for CSP & less for SI & IM

Wind Program, Highlights (FY2014-FY2012 difference)

Goals & Objectives

- Land-Based: 5.7 cents/kilowatt-hour (kwh) for energy cost of utility-scale turbines by 2020 and 4.2 cents/kwh by 2030
- Offshore: cut energy cost from 21 cents/kwh in 2010 to 17 cents/kwh by 2020 (unsubsidized)
- Increase installed windfarm capacity from 60 billion watts (gw) in 2012 to 125 gw by 2020 and 300 gw by 2030

Wind, + $52.2 M (57%)

- + $25.9 M (36%) for Technology Development
- + $17.2 M (92%) for Technology Application
- Compared to FY2013 request: more aggressive $ support

Innovation Hubs (FY2014 requested amount)

Hub focus: innovation & commercialization

- Buildings, + $24.3 M for Energy-Efficient Building Systems Design Hub (fourth year)
- Electricity Program, + $20.0 M for a new Electricity Systems Hub
- Note: DOE has announced multi-year funding (up to $120 M) for a Critical Materials Hub (Manufacturing Program), named the Critical Materials Institute—but there is no specific mention of it in the FY2014 request

Additional Reference Material

Context: Innovation & Demonstration Projects

- Innovation Valley of Death. Long-standing policy debate over the federal role in filling the gap between R&D and market commercialization.
- Demonstration projects tend to be very expensive.
- ARPA-E was created to spur development of “breakthrough” technologies.
- Loan guarantee program for innovative technologies still open, but no funding remains to cover subsidy costs.
- Budget deficit concerns tend to limit spending.

Historical Spending Context for Major Energy Technologies R&D

- FY2011 Appropriations Comparison
- FY2012 Appropriations Comparison
- FY2014 Appropriations Comparison
- Chart of Energy R&D Funding, FY2012
- Chart of Energy R&D Shares, FY1948-FY2012

FY2011: Compare Efficiency, Renewables, Nuclear, and Fossil

- Nuclear R&D ($1,173 M) was highest

  [fission ($806 M) and fusion ($367 M)]

- Renewables R&D ($807 M) was second
- Efficiency R&D ($689 M) was third
- Fossil R&D ($434 M) was fourth

FY2012: Compare Efficiency, Renewables, Nuclear, and Fossil

- Nuclear R&D ($1,247 M) was highest

  [fission ($854 M) and fusion ($393 M)]

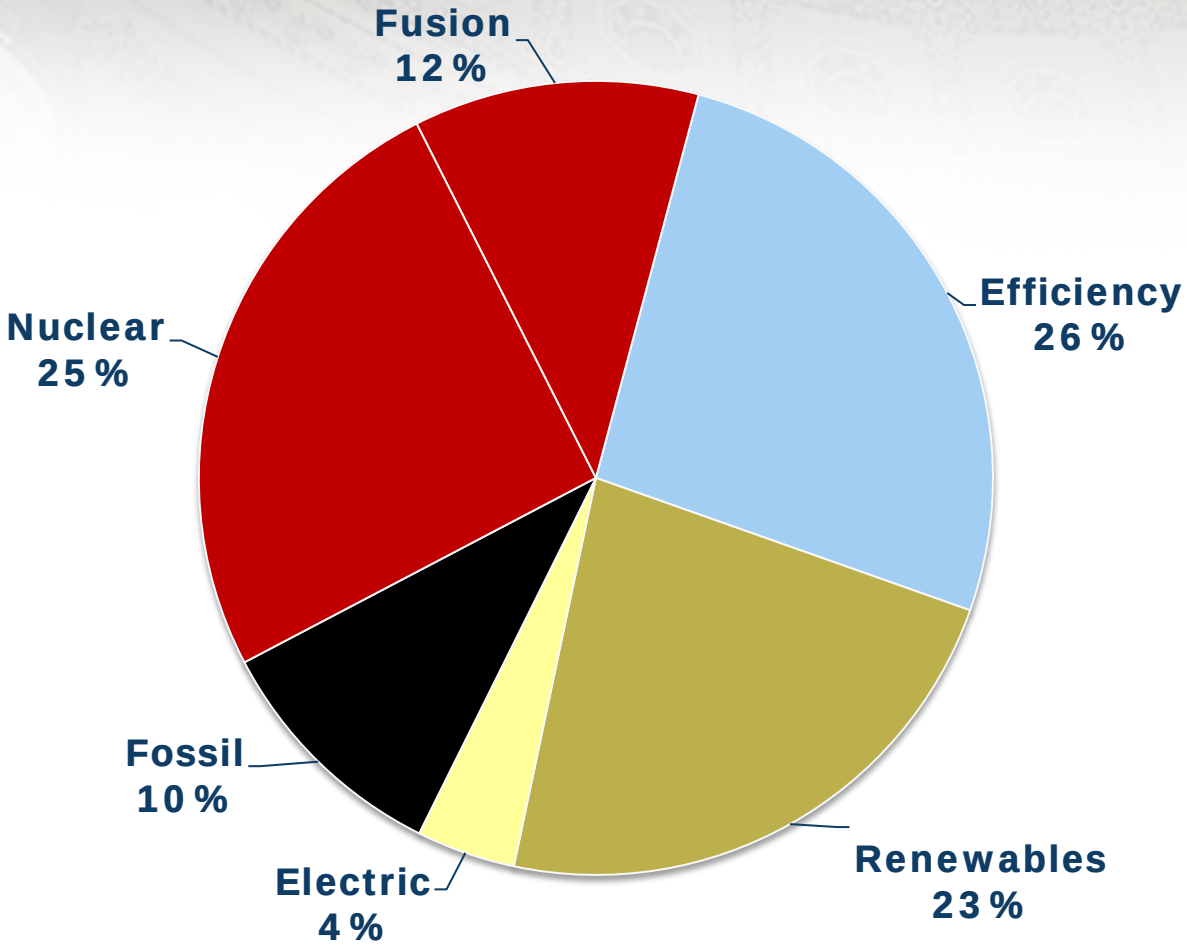
- Efficiency R&D ($888 M) was second
- Renewables R&D ($775 M) was third
- Fossil R&D ($337 M) was fourth

FY2014: Compare Efficiency, Renewables, Nuclear, and Fossil

- Efficiency R&D ($1,510 M) is highest
- Nuclear R&D ($1,194 M) is second

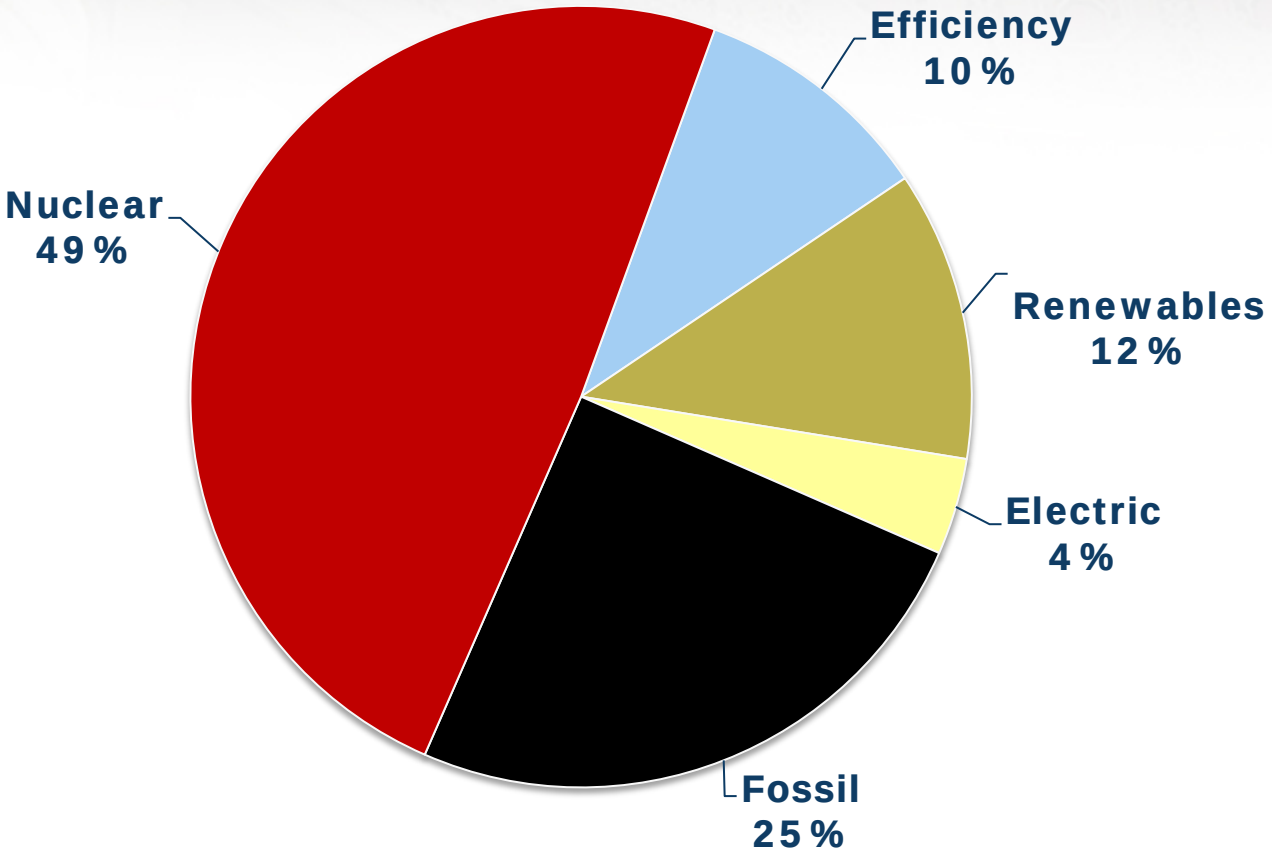
  [fission ($735 M) and fusion ($458 M)]
- Renewables R&D ($1,031 M) is third
- Fossil R&D ($421 M) is fourth
- Historically, much less spent for efficiency and renewables than for nuclear and fossil

Chart of Energy R&D Funding Shares, FY2012



Source: DOE FY2014 Cong. Budget Request. Fusion is funded under Office of Science, all others under Energy Resources Supply and Conservation.

DOE Energy R&D Funding Shares, FY1948-FY2012



Note: Nuclear includes Fission and Fusion. Source: DOE, Analysis of Federal Incentives, 1980 & DOE History Table. Also, see CRS report RS22858.

Framework of Issues for Staff

- Role of Government
- Budget deficit
- Trade deficit & Competitiveness
- Energy security
- Energy prices
- Pollution & Greenhouse gas emissions

Further information available to Congressional Staff:

- CRS R42498, DOE FY2013 appropriations
- CRS R41908, DOE FY2012 appropriations
- CRS R41150, DOE FY2011 appropriations
- CRS RS22858, on R&D Funding History
- All are on the CRS web site at:
- www.crs.gov
- Fred is at 7-7039, fsissine@crs.loc.gov