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Sustainable EV Deployment in Cities: Findings from the Electric Vehicles Initiative (EVI)

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Electric Vehicles Initiative

- Announced at the Clean Energy Ministerial in Washington DC, July 2010
  - 14 countries: China, Denmark, Finland, France, Germany, India, Japan, Netherlands, Portugal, South Africa, Spain, Sweden, United Kingdom, United States
  - Together these counties account for about 80% of world's vehicle demand, probably most of EV sales in coming years
  - International Energy Agency is a partner, serves a coordinating role
- Three primary objectives:
  - Common data collection/analysis efforts
  - Greater RD&D collaboration
  - City forum that links cities within EVI countries
- Recent Events: Pilot Cities conference in Shanghai, April 2011, Barcelona November 2011
- Upcoming Event: EVS 26 Meeting in LA, May 6-9 2012

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Projected electric and plug-in hybrid vehicle sales through 2020, based on national targets

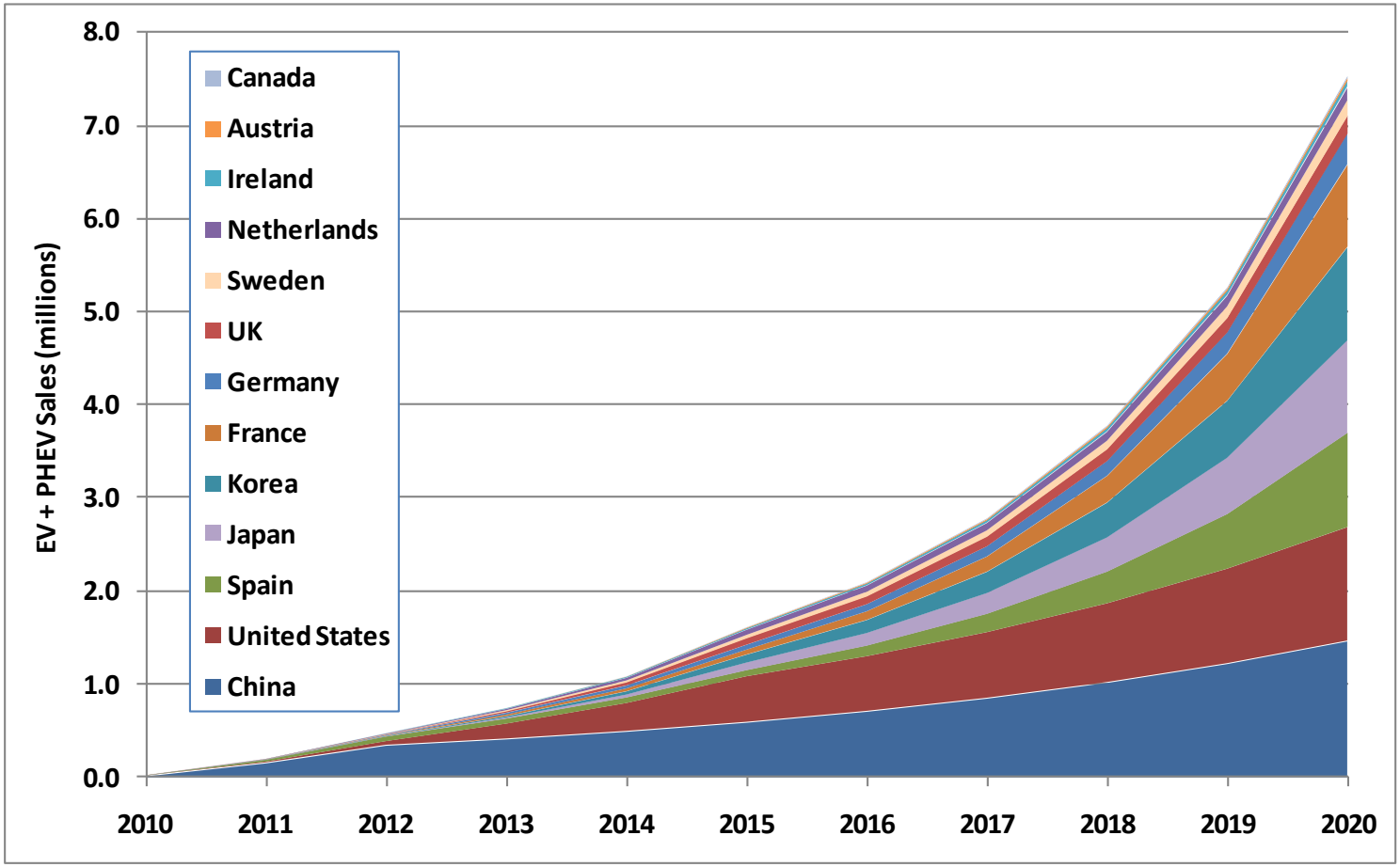

Figure based on announced national sales and stock targets, with assumed 20% annual sales growth after target is met, if target is before 2020 (e.g. China's target is for end of 2011).

EV / PHEV sales could reach seven million by 2020

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Projected electric and plug-in hybrid vehicle stock (cumulative sales) through 2020, based on national targets

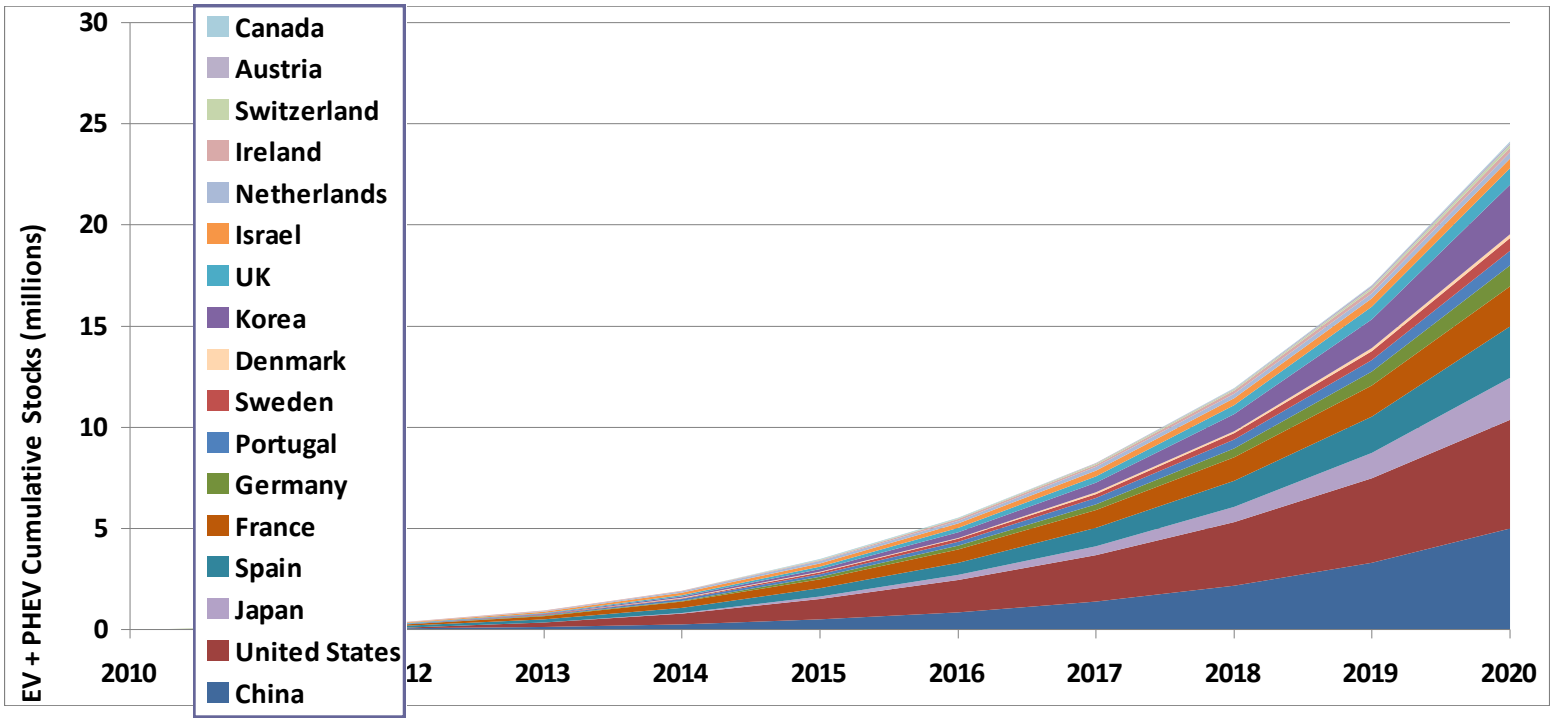

Figure based on announced national sales and stock targets, with assumed 20% annual sales growth after target is met, if target is before 2020 (e.g. China's target is for end of 2011).

EV / PHEV stock could reach 25 million by 2020

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Some EV issues / questions

- Valley of death
  - High cost of cars
  - Lack of infrastructure
  - Need for major investments (by whom?)
  - Consumer awareness issues
  - Risk aversion
- Uncertainties
  - Will battery costs come down? How far?
  - What do the first 1/5/10% market share buyers want and need in an EV?
  - When and how will people recharge?
  - What will be the real CO2 impacts?

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Some observations / questions

- EV sales will need to nearly double each year to reach 20 million on road by 2020
  - Means hitting about 1 million annual vehicle sales by 2016 or so
- We figure battery costs have to come down to USD 300/kWh after 1 million cars to have a chance to make this.
  - What are battery costs today? Not clear, but claims that they are below $500 abound
- Policy frameworks are coming into place but are they enough?
- What do the 100,000 th, 500,000th, 1 million-th potential buyers look like?
- Will the infrastructure be there?
- Will the manufacturers over supply or under supply the market?

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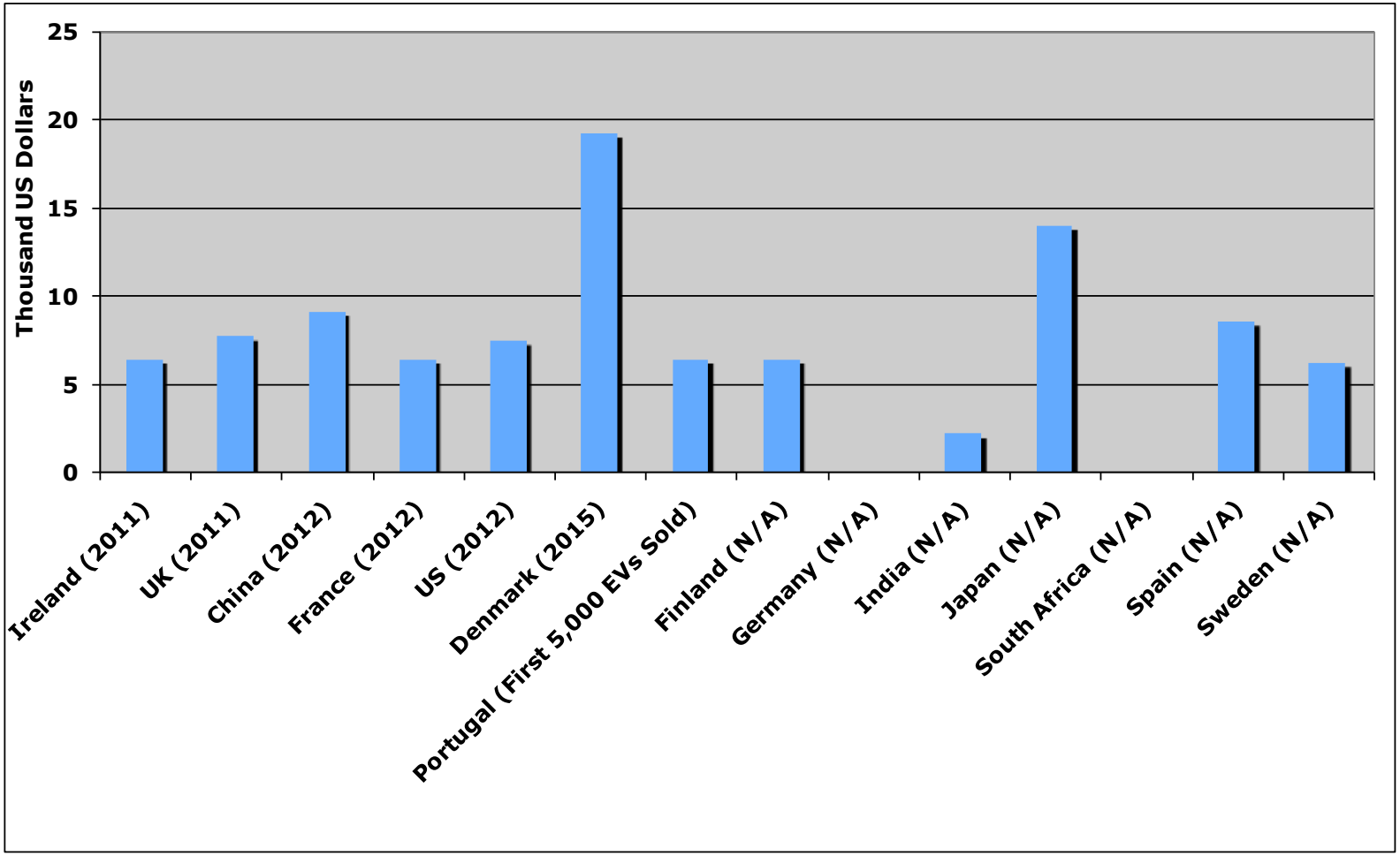
EV Incentives per vehicle, by country



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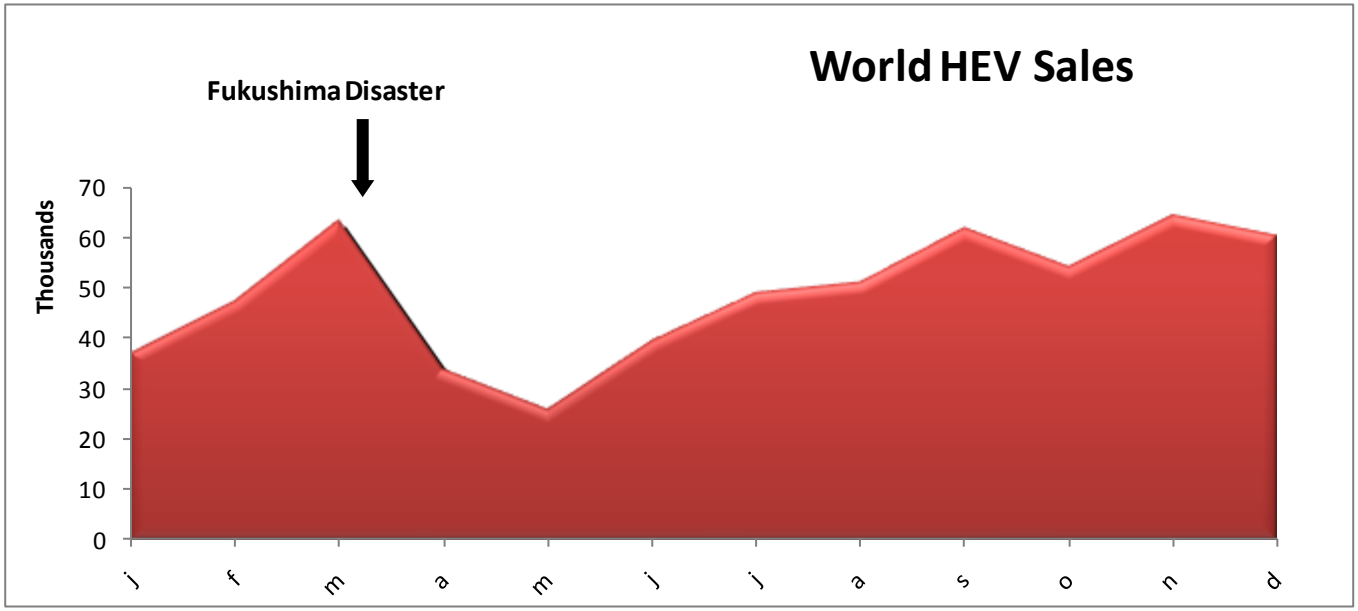
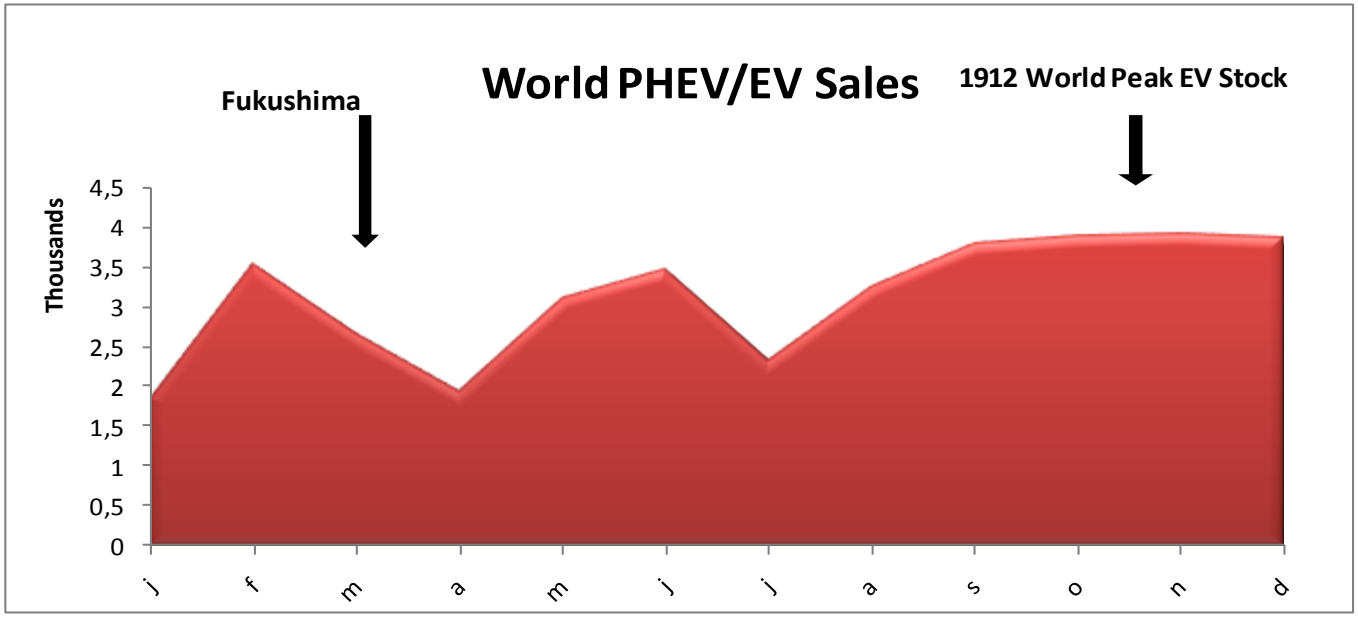
2011 -the year in sales

Source: Marklines Data





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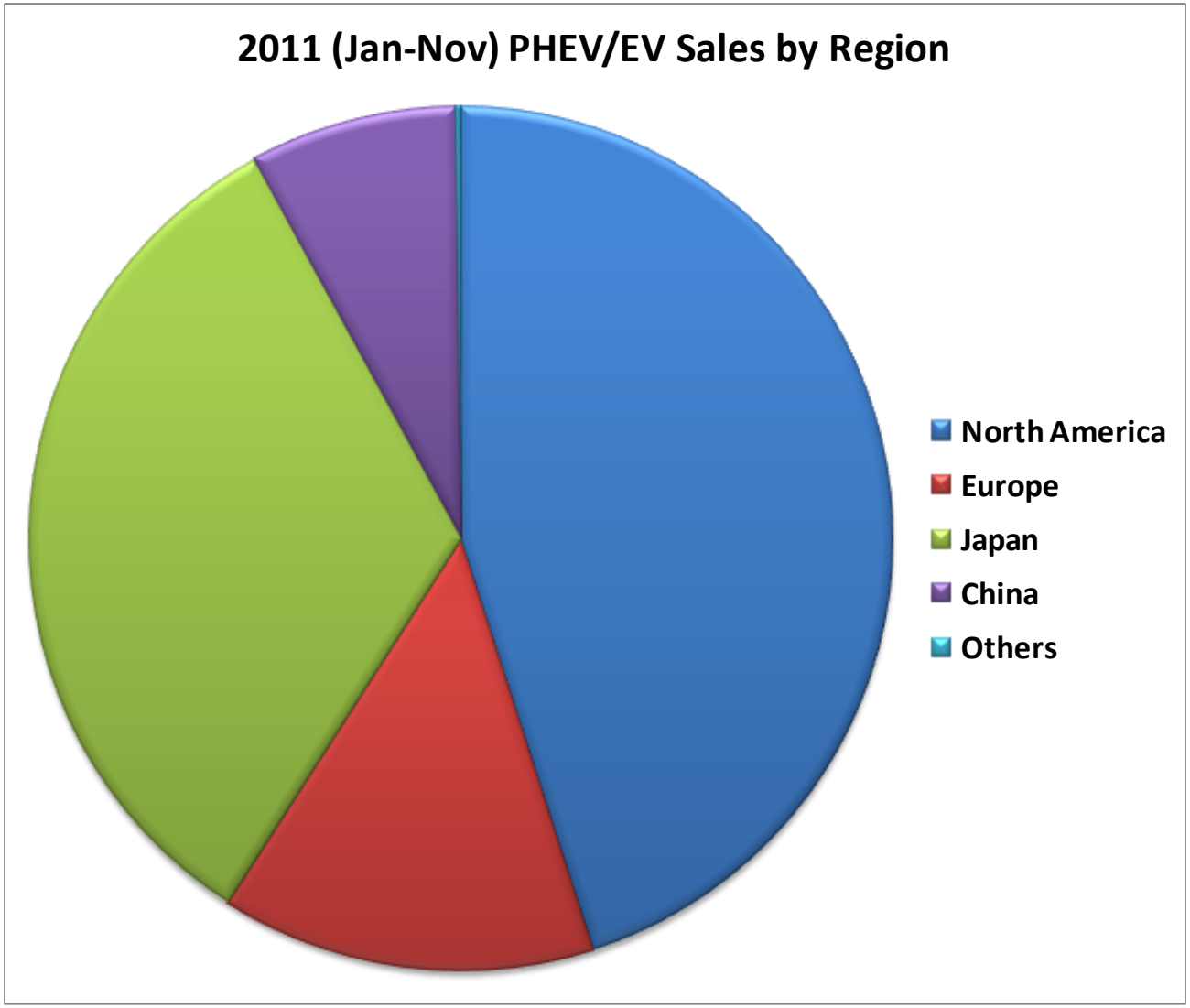
EV sales by region

Close to 40,000 total worldwide



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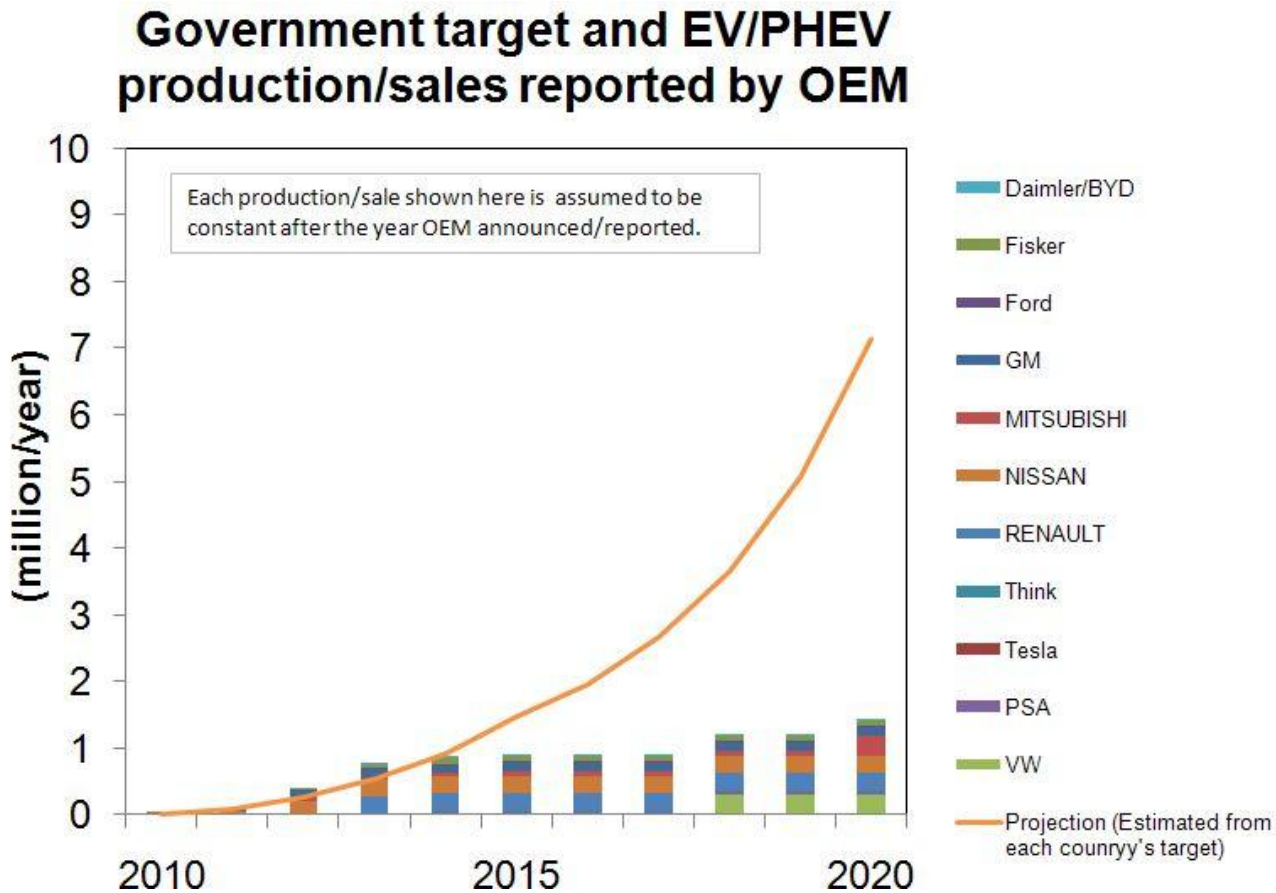
Announced EV/PHEV model capacity targets



The announced sales/capacity targets appear adequate for a few years, but not enough to meet a national combined 7 million EV/PHEV on-road target for 2020

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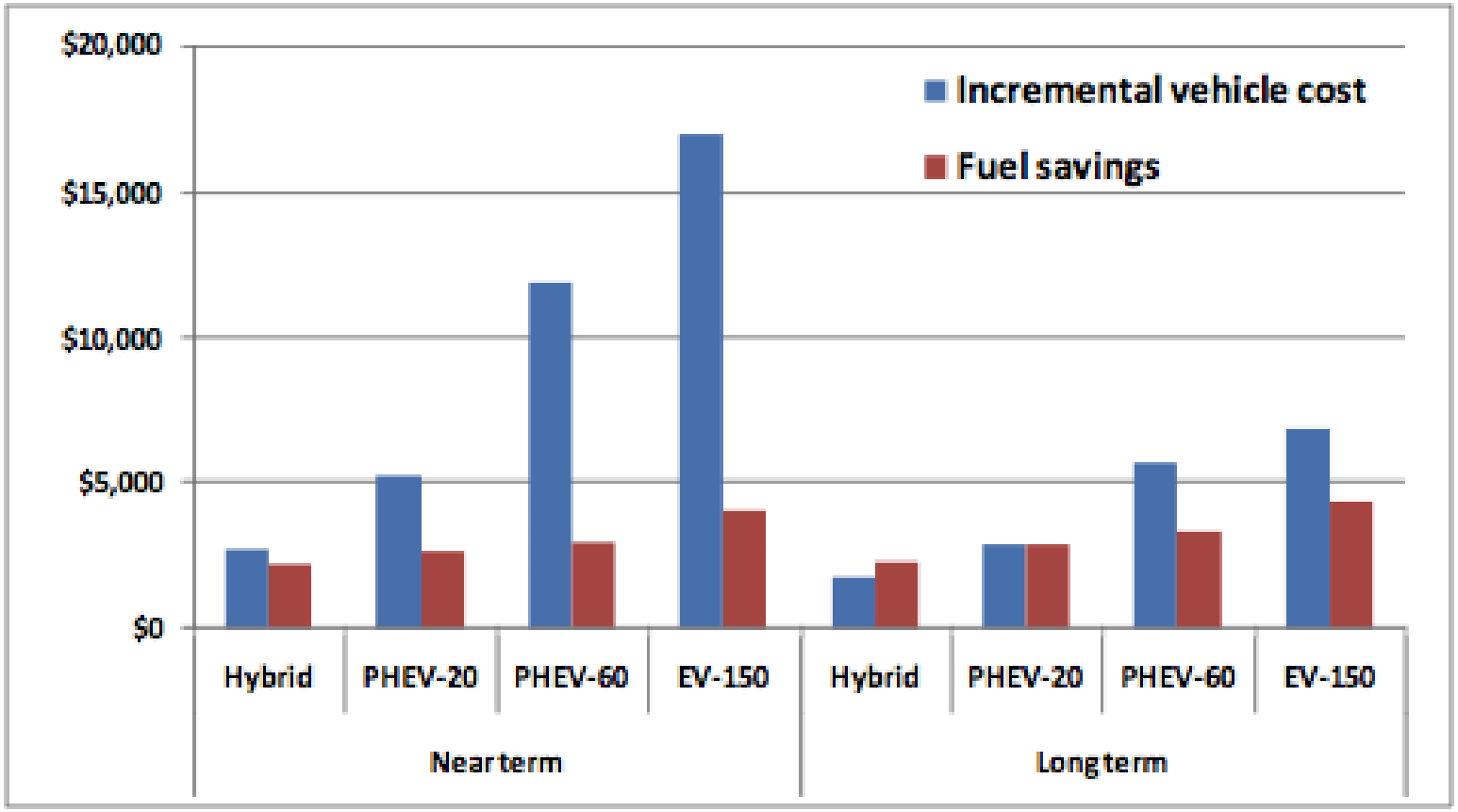
Some cost estimates

Hybrids, PHEVs and EVs v. gasoline vehicle over time



Notes: PHEV-20= 20 km range, etc; fuel savings estimated over 160k kms of driving; base gasoline vehicle efficiency improves over time; oil prices $80/bbl near term, $120/bbl long term; battery costs decline over time from $750 to about $300/kWh

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Spending – is it enough?

- Preliminary EVI data indicates spending of about $2-3 billion per year on EV-related RD&D, incentives, infrastructure
  - Context of $2-3 trillion dollar auto industry
- Through 2020 an incentive of $5,000 per vehicle for 20 million vehicles around the world would cost $100 billion
  - Context of $40-50 trillion globally to be spent on car purchases in that time frame
  - Average of $200 per car would pay for this.
  - Build into a feebate approach? (like France)

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