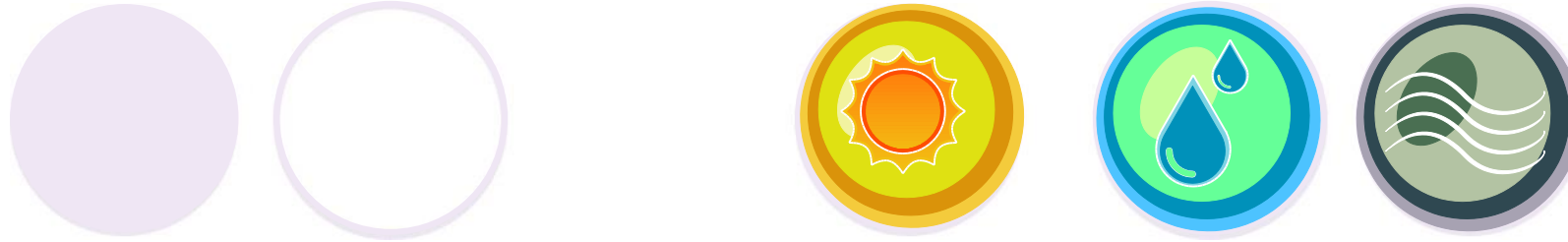


# Renewables: The True Costs

Cost Analysis at IRENA

Kuala Lumpur, 24 April 2014





## Renewable Energy can provide:

**01** Secure supplies

**02** Reliable service

**03** Energy access

**04** Affordably

# Cost Analysis



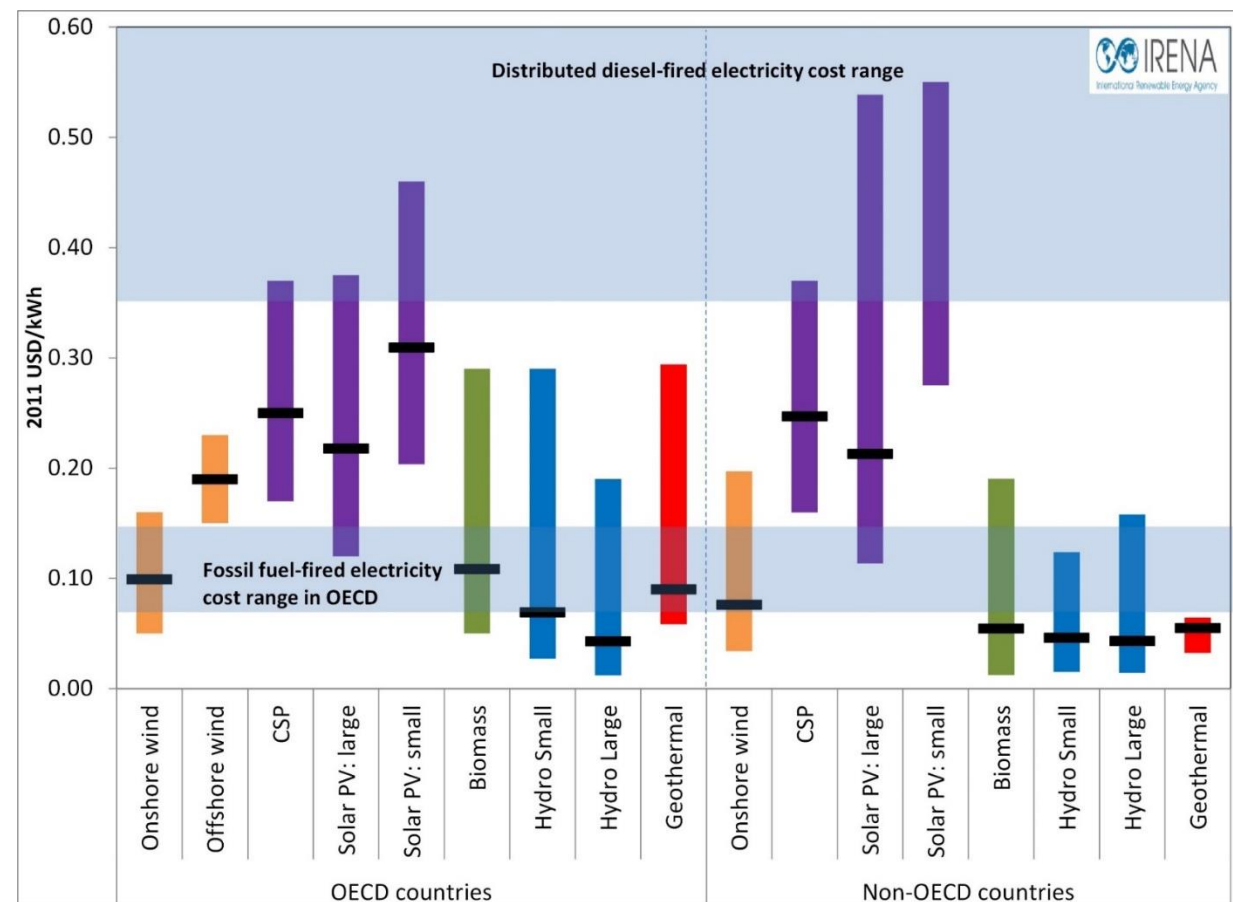
- Lack of objective and up-to-date data is a barrier
- Cost declines, rapid for some renewables
- But, decision making is often based on:
  - outdated numbers
  - opinion, not fact based
- IRENA to strive to become THE source for cost data – *IRENA Renewable Costing Alliance*
- Goals:
  - Assist government decision-making, allow more ambitious policies
  - Fill a significant information gap

# Highlights



What do the costs of 9000 utility-scale and over 150k small-scale RE projects look like?

Renewable power generation is increasingly competitive



# Wind power



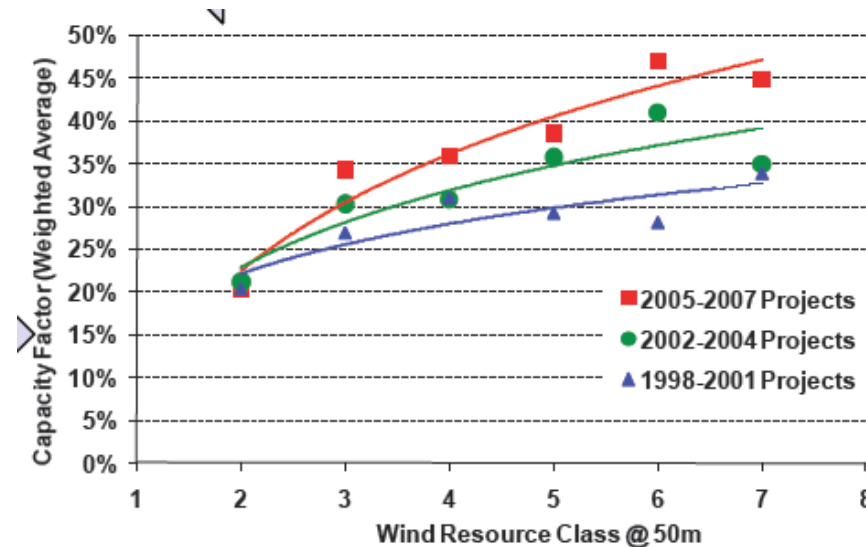
Higher capacity factors from improved technology



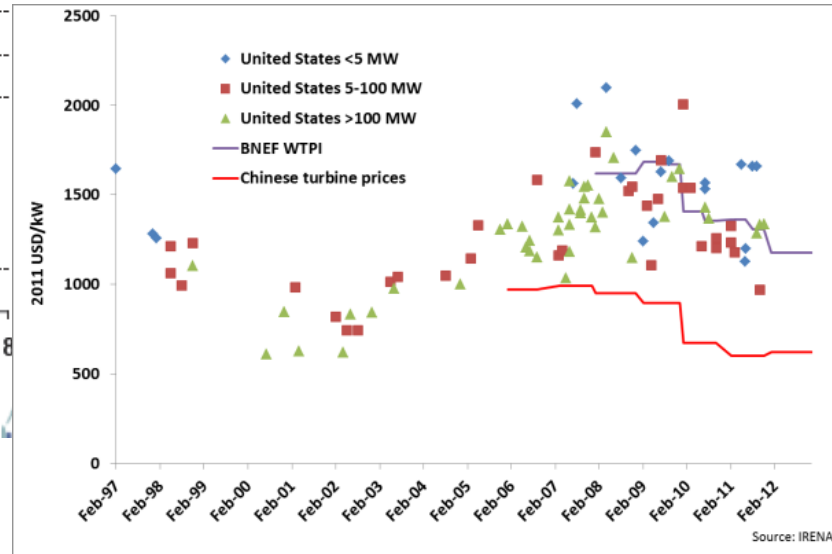
Wind turbine cost reductions



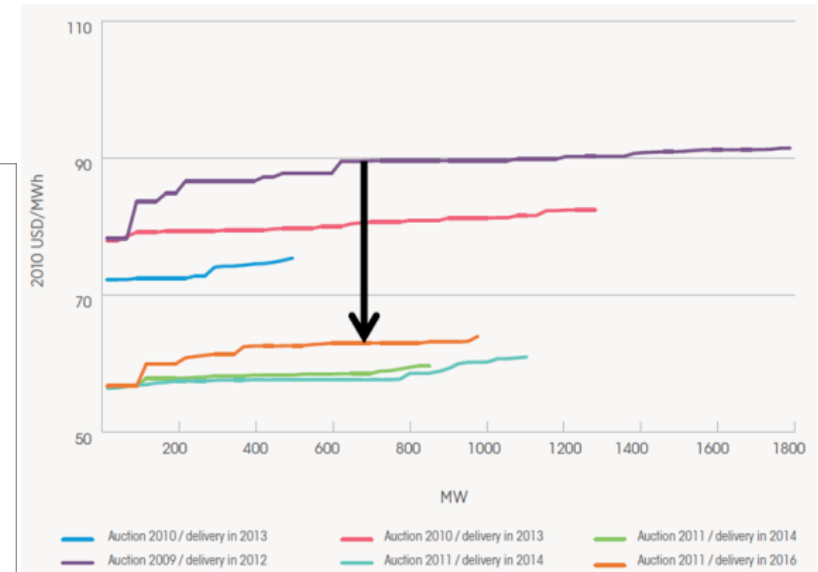
LCOEs are falling



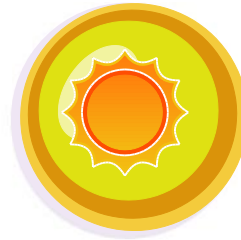
Source: Lawrence Berkeley National Laboratory



Source: IRENA

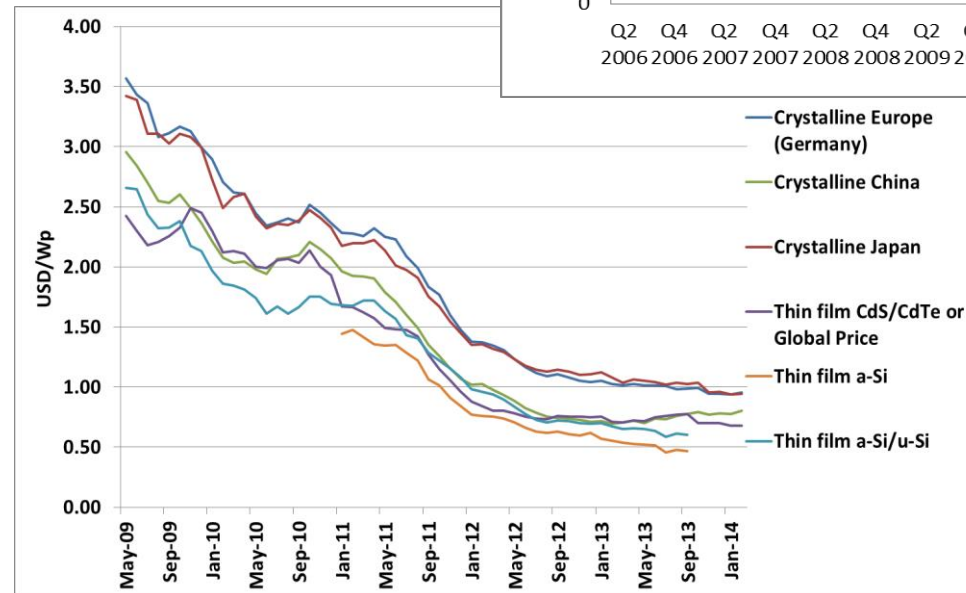
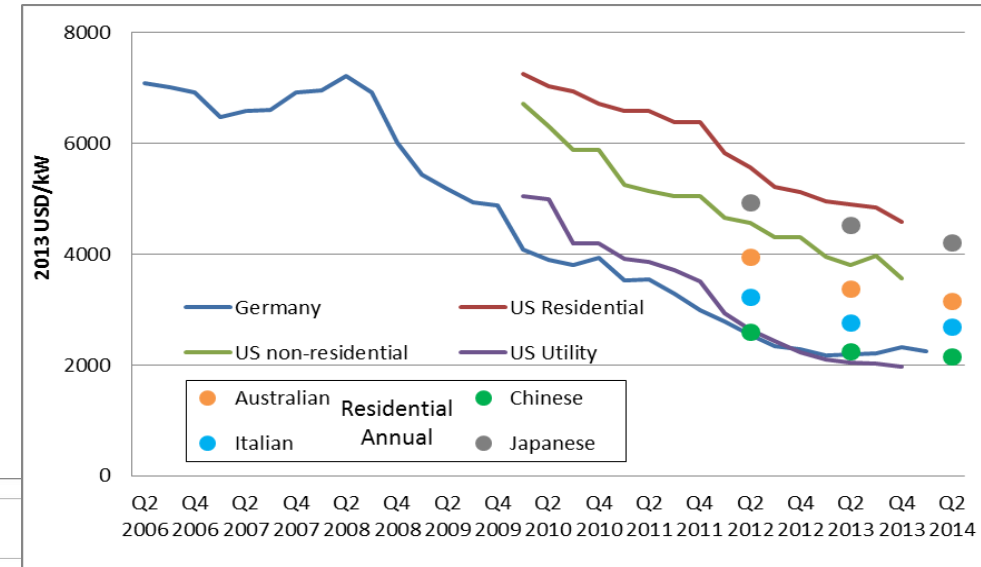


# Solar PV Trends



Module price declines pause as industry attempts to improve margins

BoS costs now hold key to large-scale future cost reductions:  
Continued declines?  
For how long?

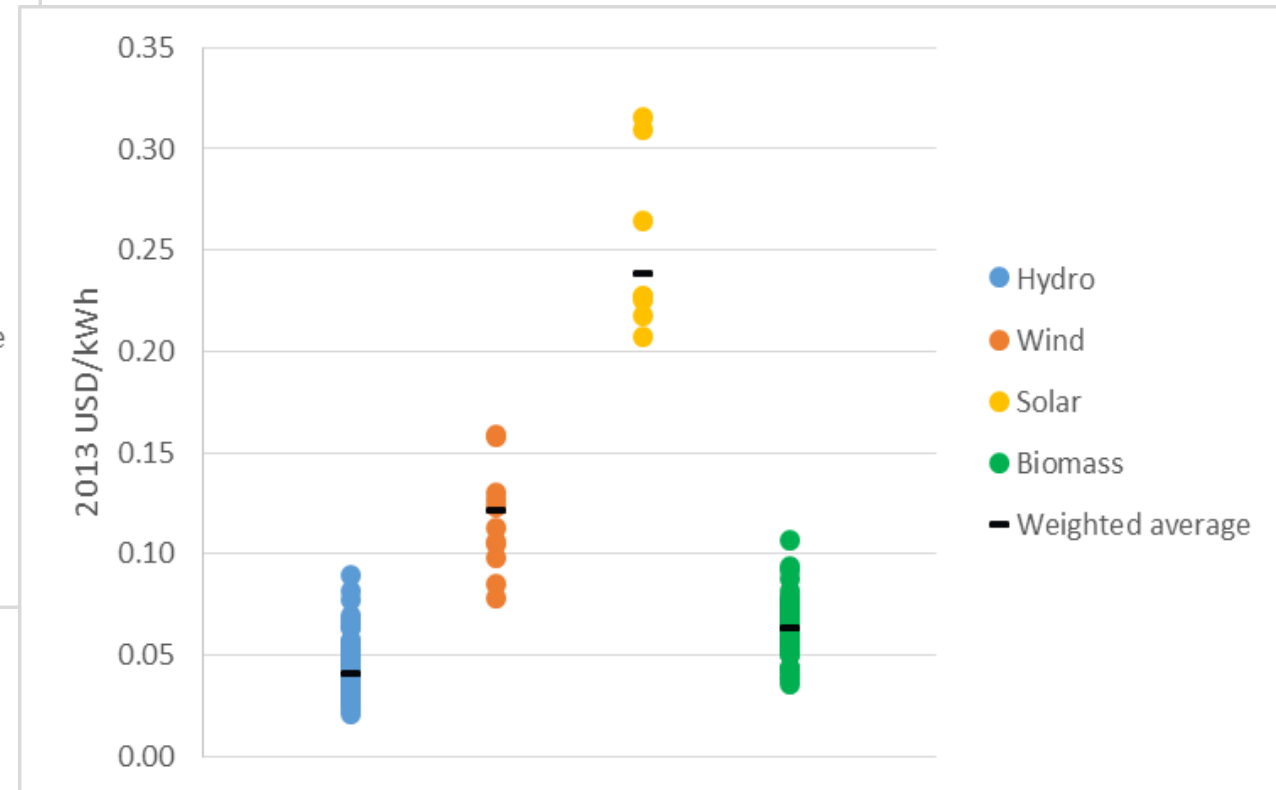
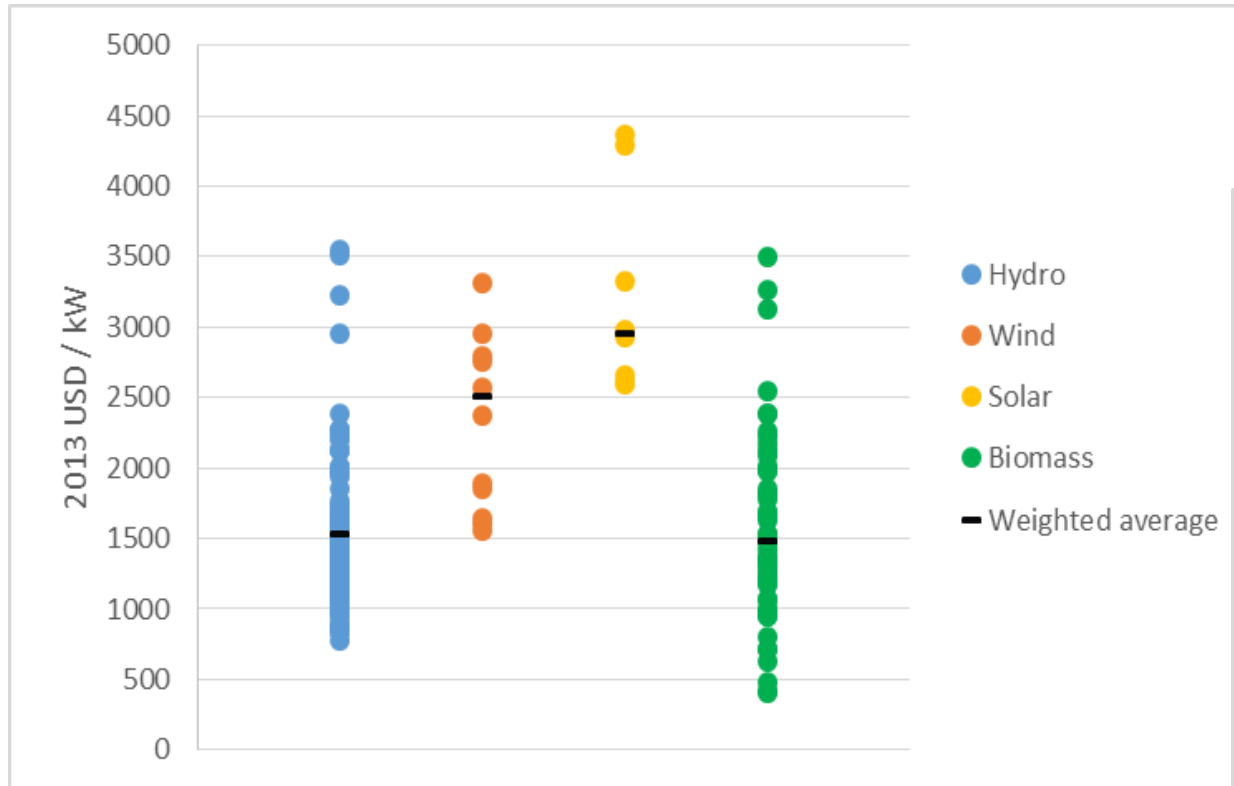
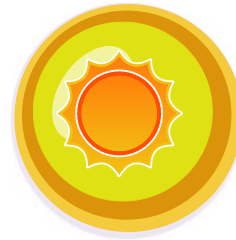


# ASEAN Data



- We have relatively few data points
- Would be delighted to work more closely with ASEAN countries
- IRENA Renewable Costing Alliance is open to any with real world project
- Data for 129 hydro projects, 55 biomass projects, 10 wind and 9 utility-scale solar PV projects

# Capital costs and LCOE





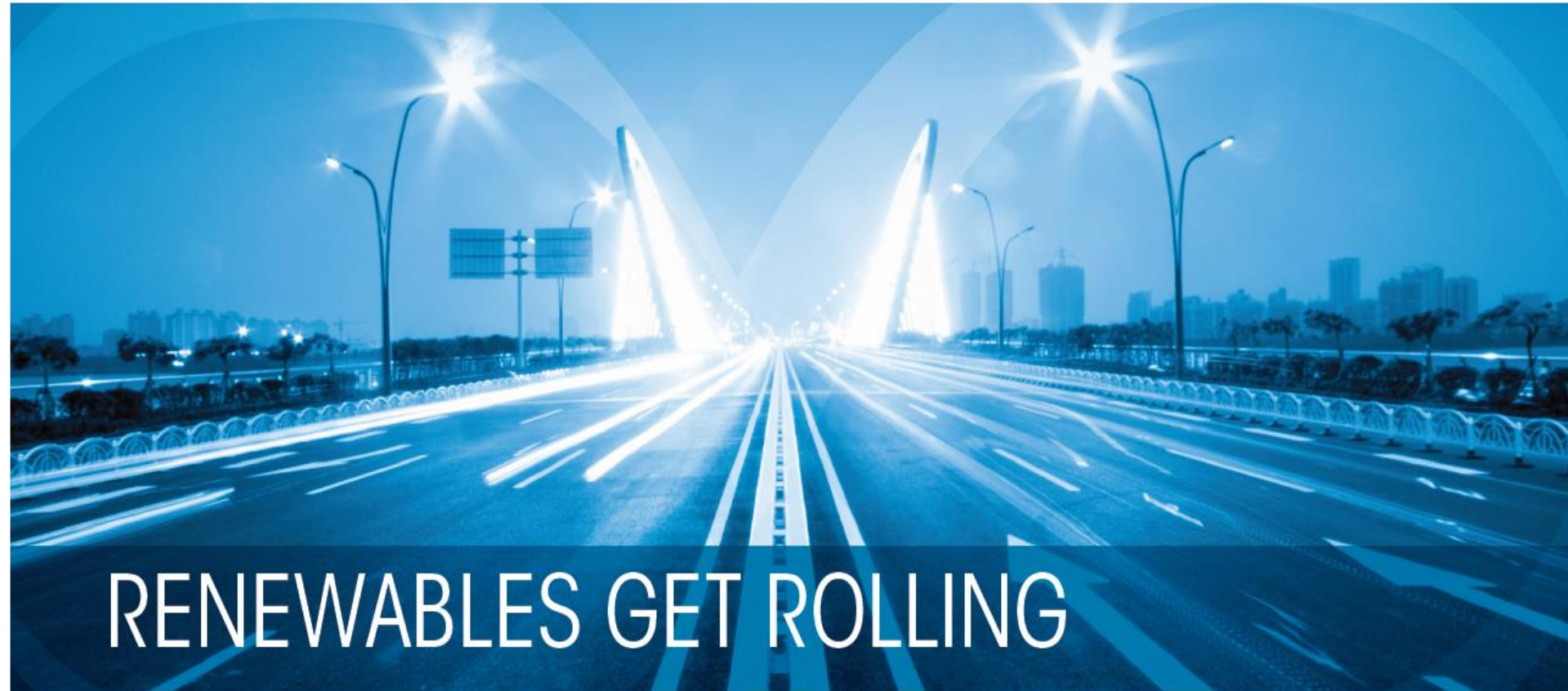
# Road Transport



IRENA's newest costing publication:

*Road Transport – The Cost of Renewable Solutions*

NOVEMBER 2013



RENEWABLES GET ROLLING

Outlook to 2020 and beyond is promising

Advanced biofuels and electrification  
to be competitive

Don't forget biomethane!

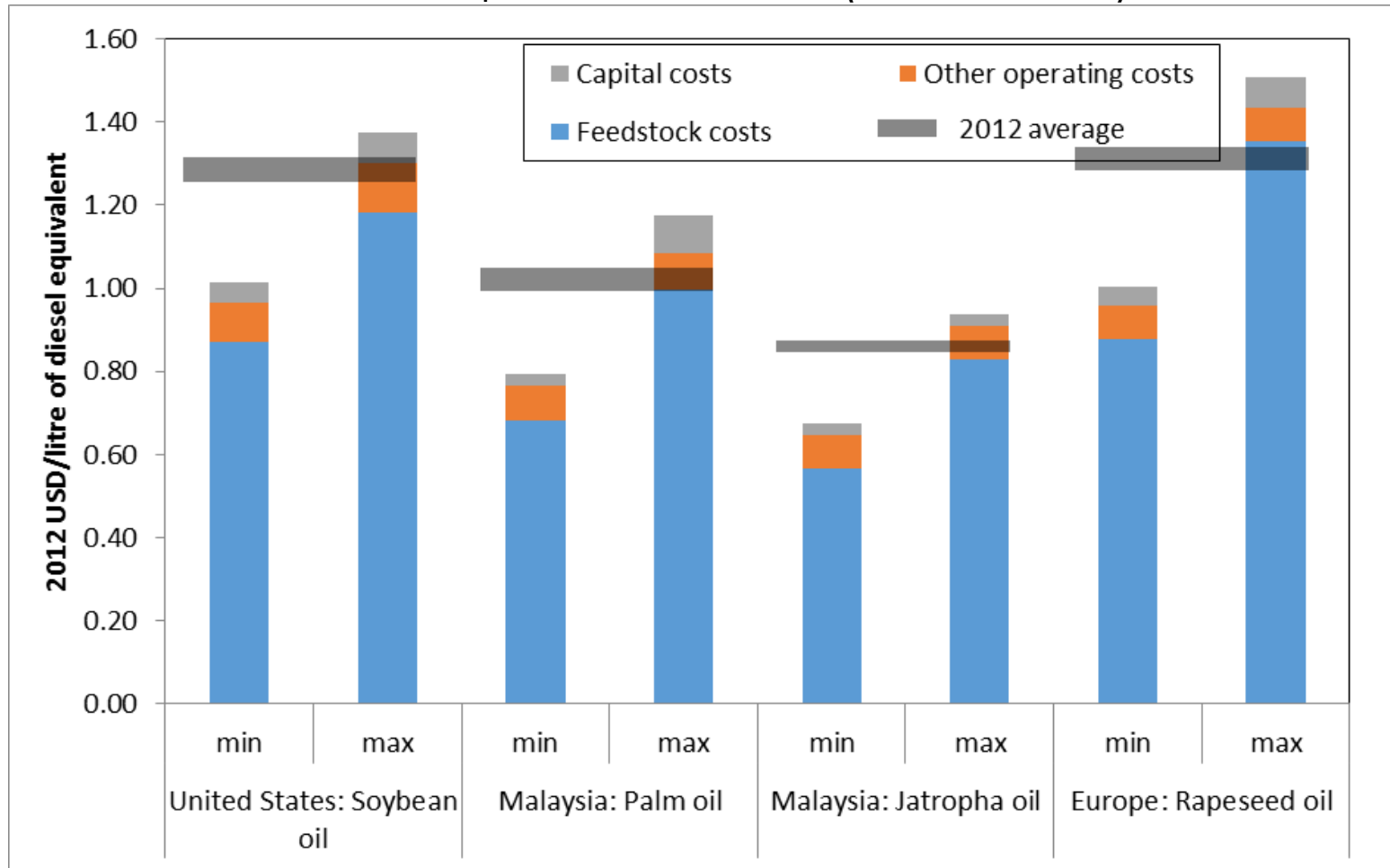


**Success**  
Just Ahead

# Conventional biofuels: Biodiesel



Biodiesel production costs (2009 to 2010)

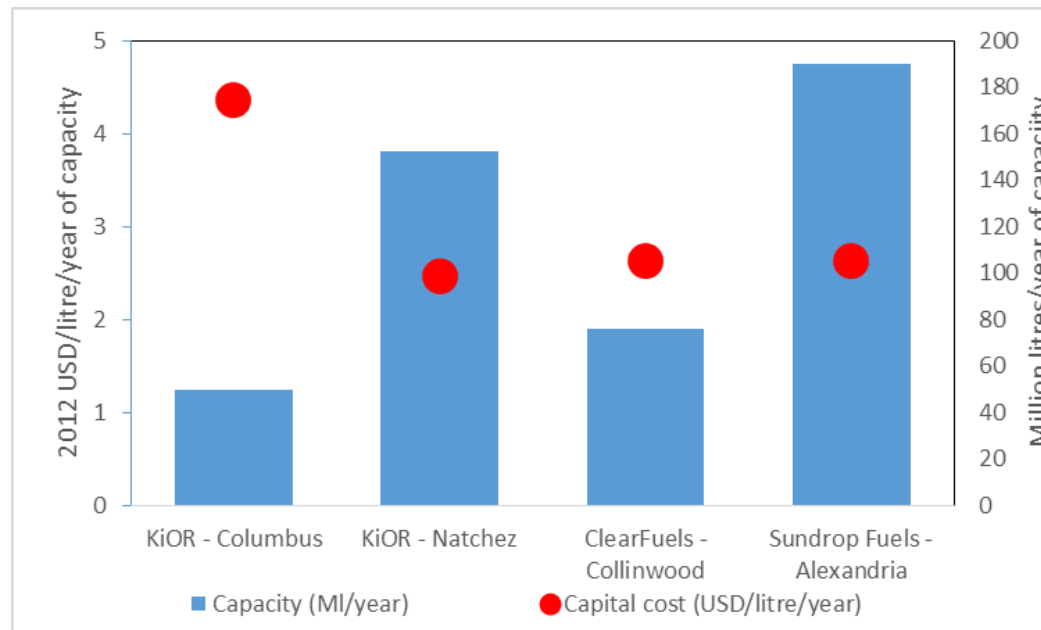
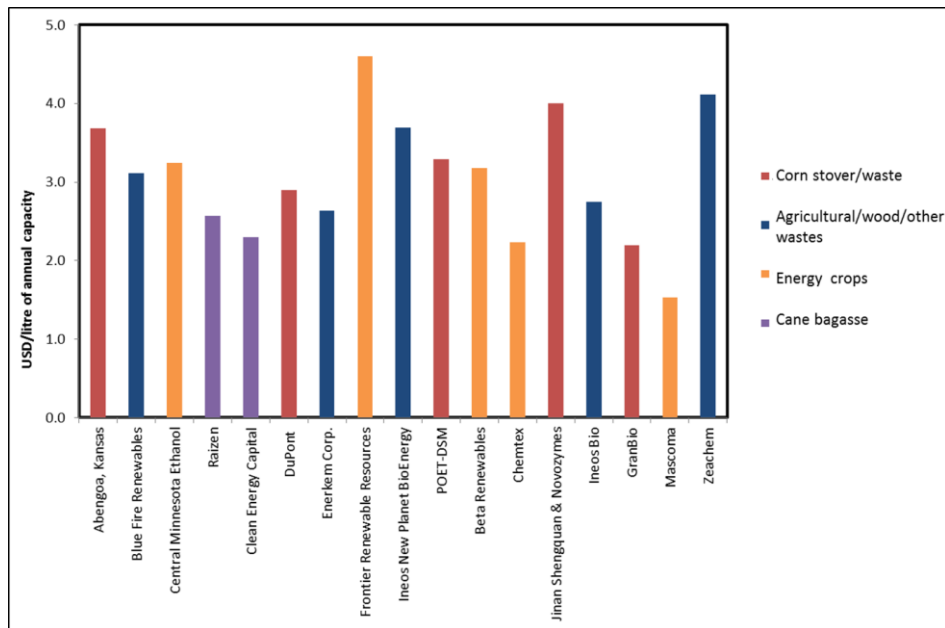




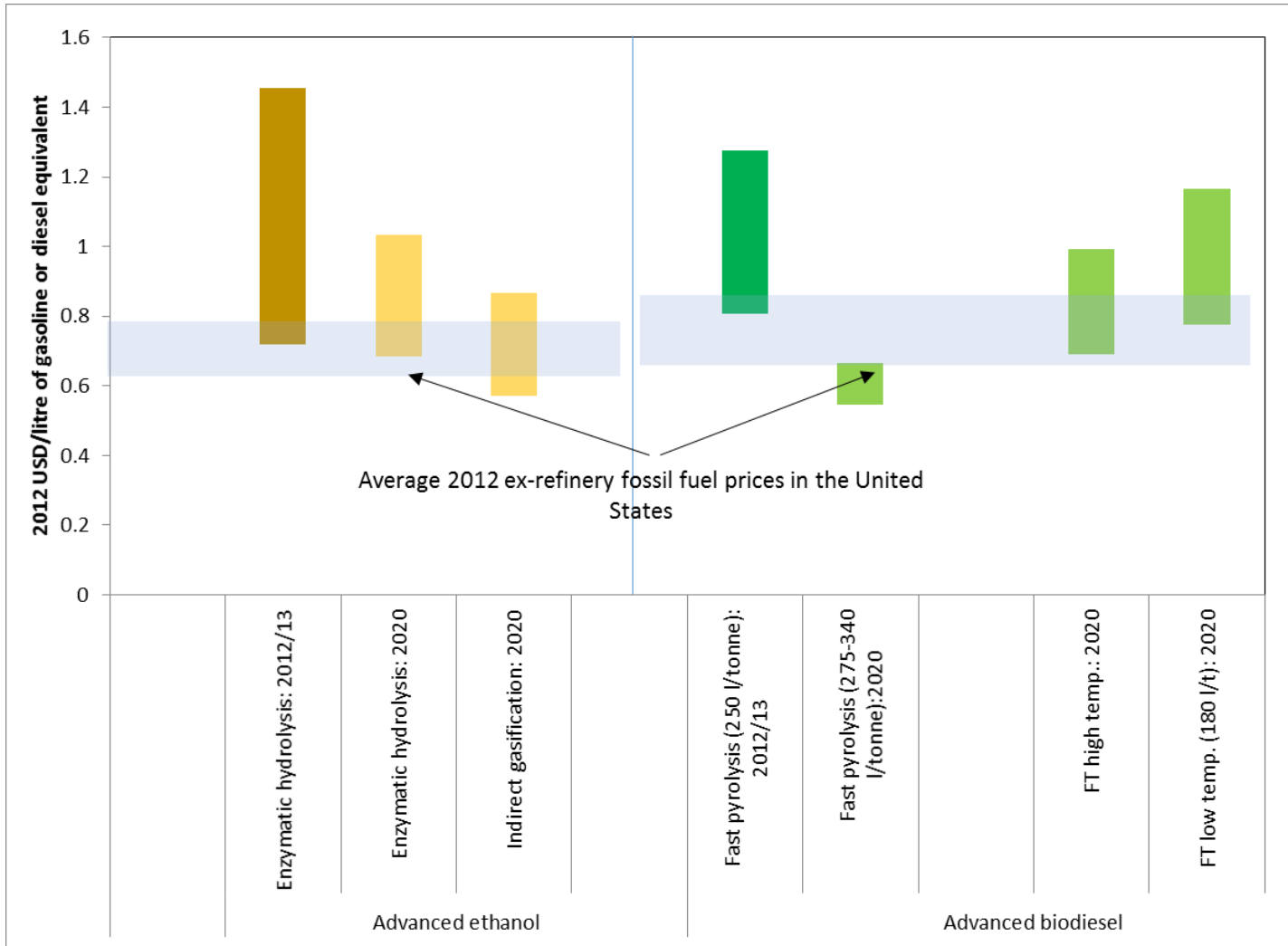


# Advanced biofuels

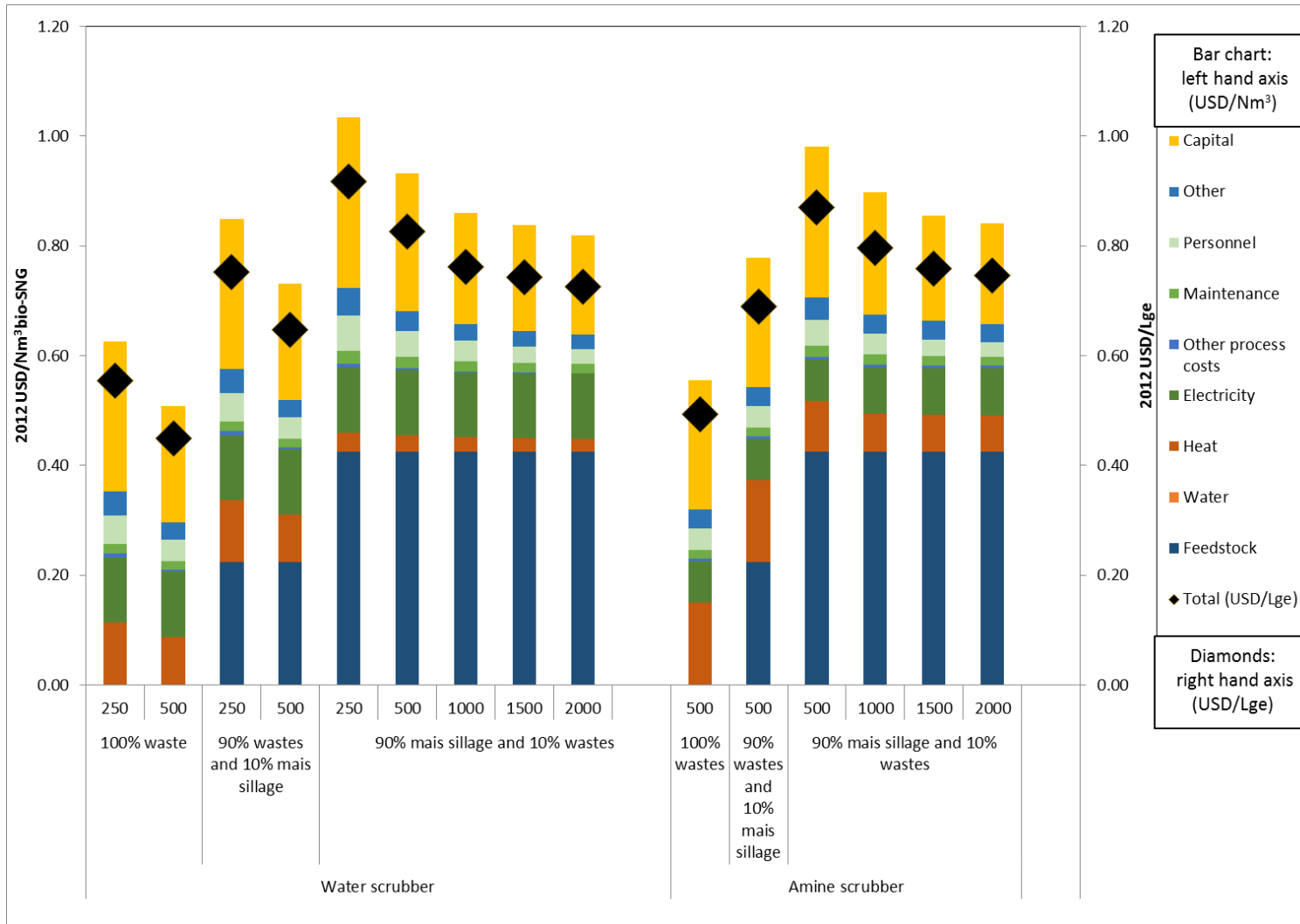
## Numerous advantages



# Advanced biofuels



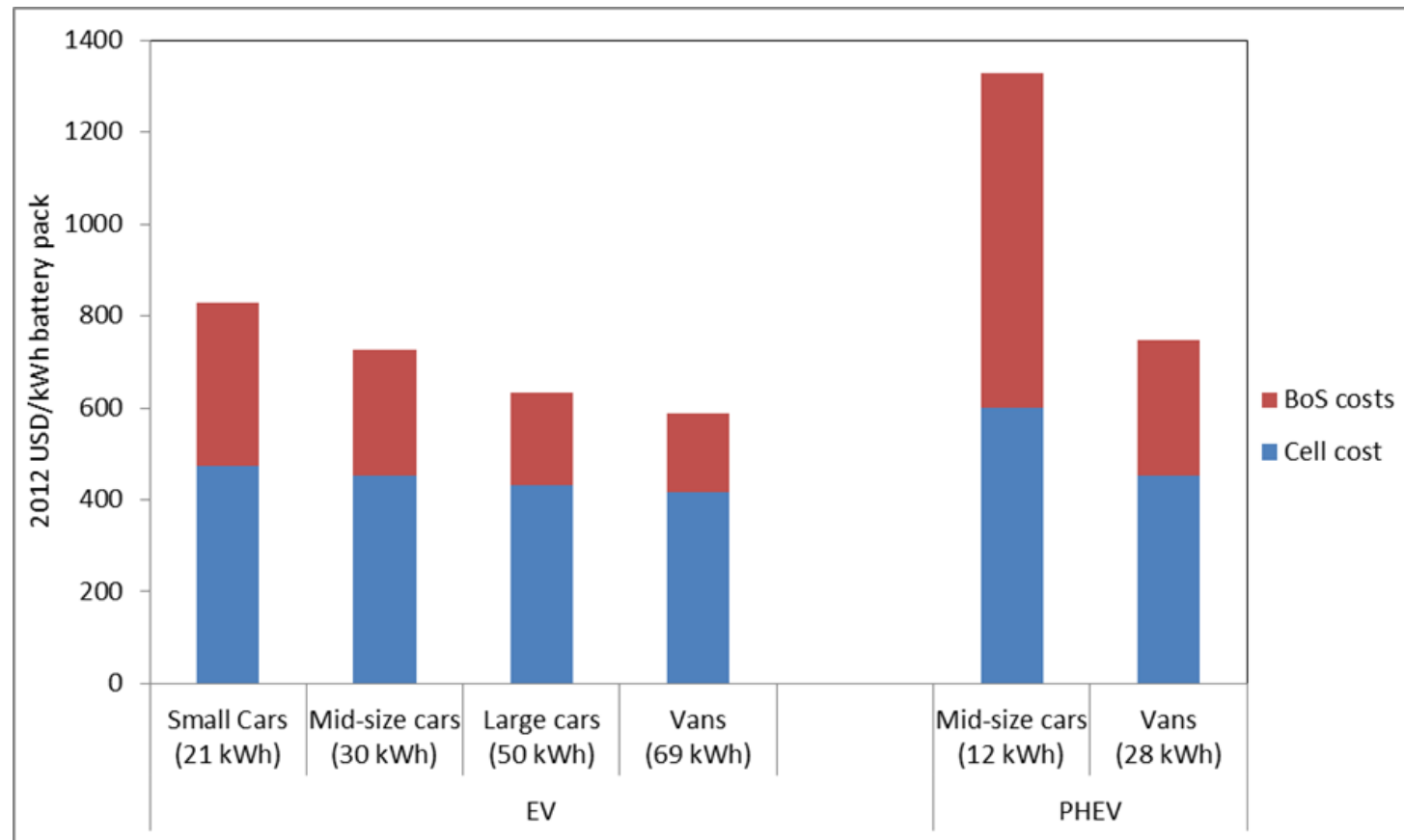
# Biomethane



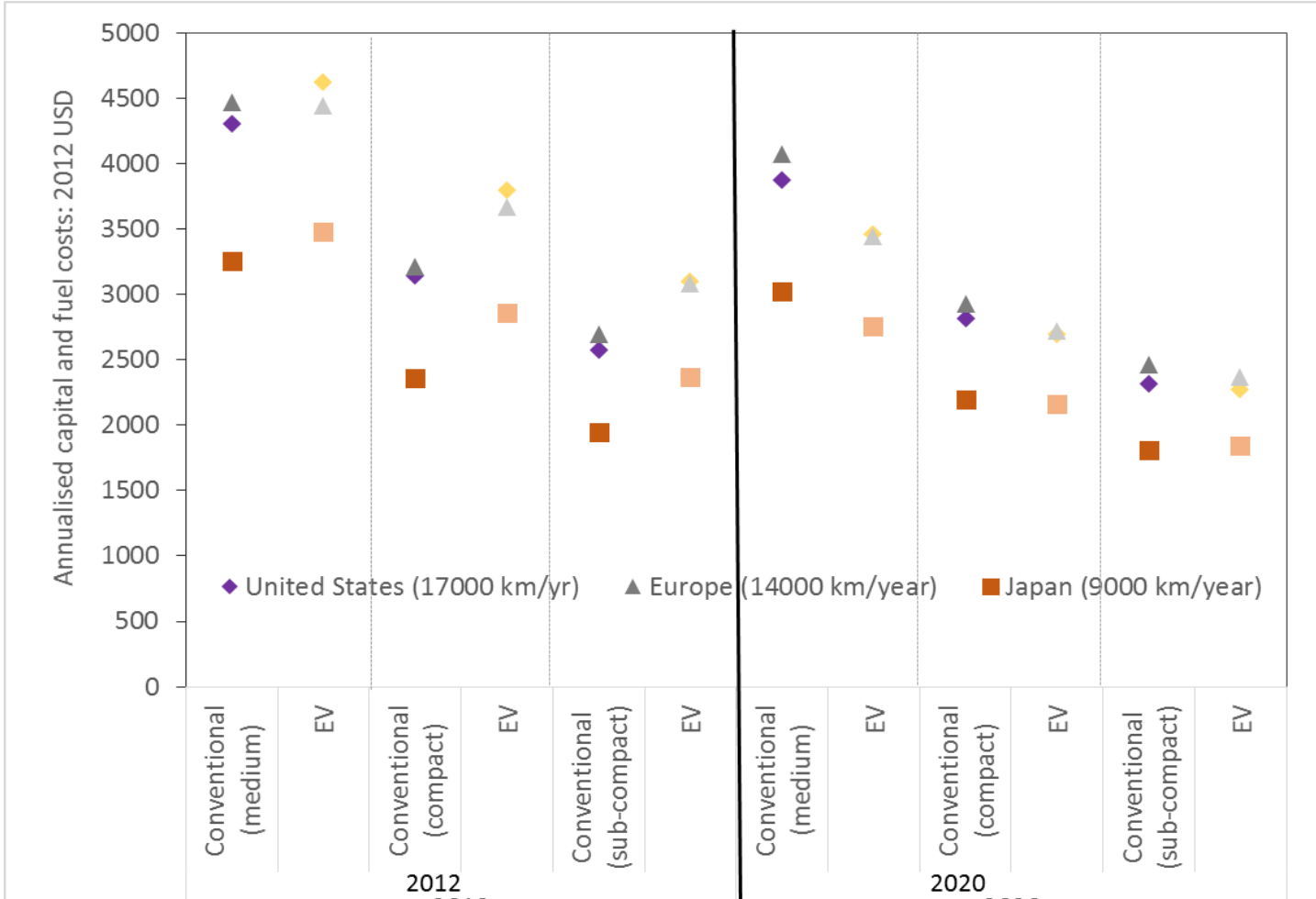
# Electrification



Battery pack costs are still too high, EV's could be a more interesting solution than PHEV's



# Pure electric vehicles

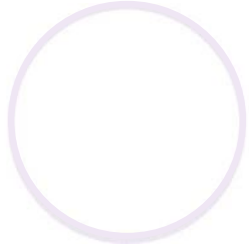
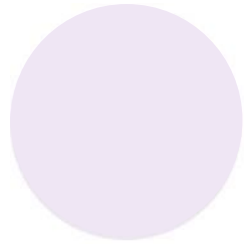




# Conclusions for transport



- Commercialisation of advanced biofuels and electric vehicles beginning
  - Current cost view mixed, but some very encouraging signs
  - Cost reductions to 2020 will improve economics
  - But next 18 months will be critical to proving reliability and identifying rate of cost reduction
- Biomethane an oft overlooked, but economic transport fuel
- We could be seeing the beginning of competitive renewable transport solutions
- Will require enhanced and expanded policy support
- Investment in refuelling infrastructure will be required
- IRENA Renewable Costing Alliance will assist with future analysis



# IRENA Renewable COSTING ALLIANCE

# Rationale and goal



Low hanging fruit is gone

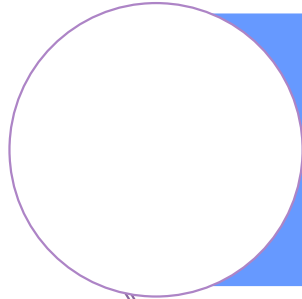
Shift the emphasis

Deepen the analysis

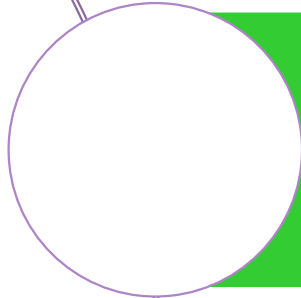
Engage with industry

Collect more, better data

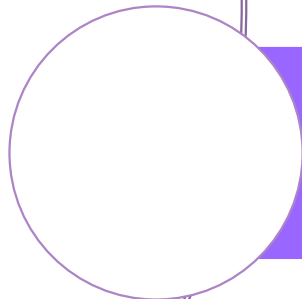
# Alliance structure



Member countries



Private sector  
members



Observers

Renewables are increasingly competitive...

...but more needs to be done

IRENA is part of the solution



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[www.irena.org/costs](http://www.irena.org/costs)