

# The Customer Benefits of Electric Drive

Roger Martin

Unicell Limited



Electric  
Mobility  
Canada

Mobilité  
électrique  
Canada



**Purolator**

**ZERO**  
emissions

**ELECTRIC VEHICLE**  
for a cleaner delivery

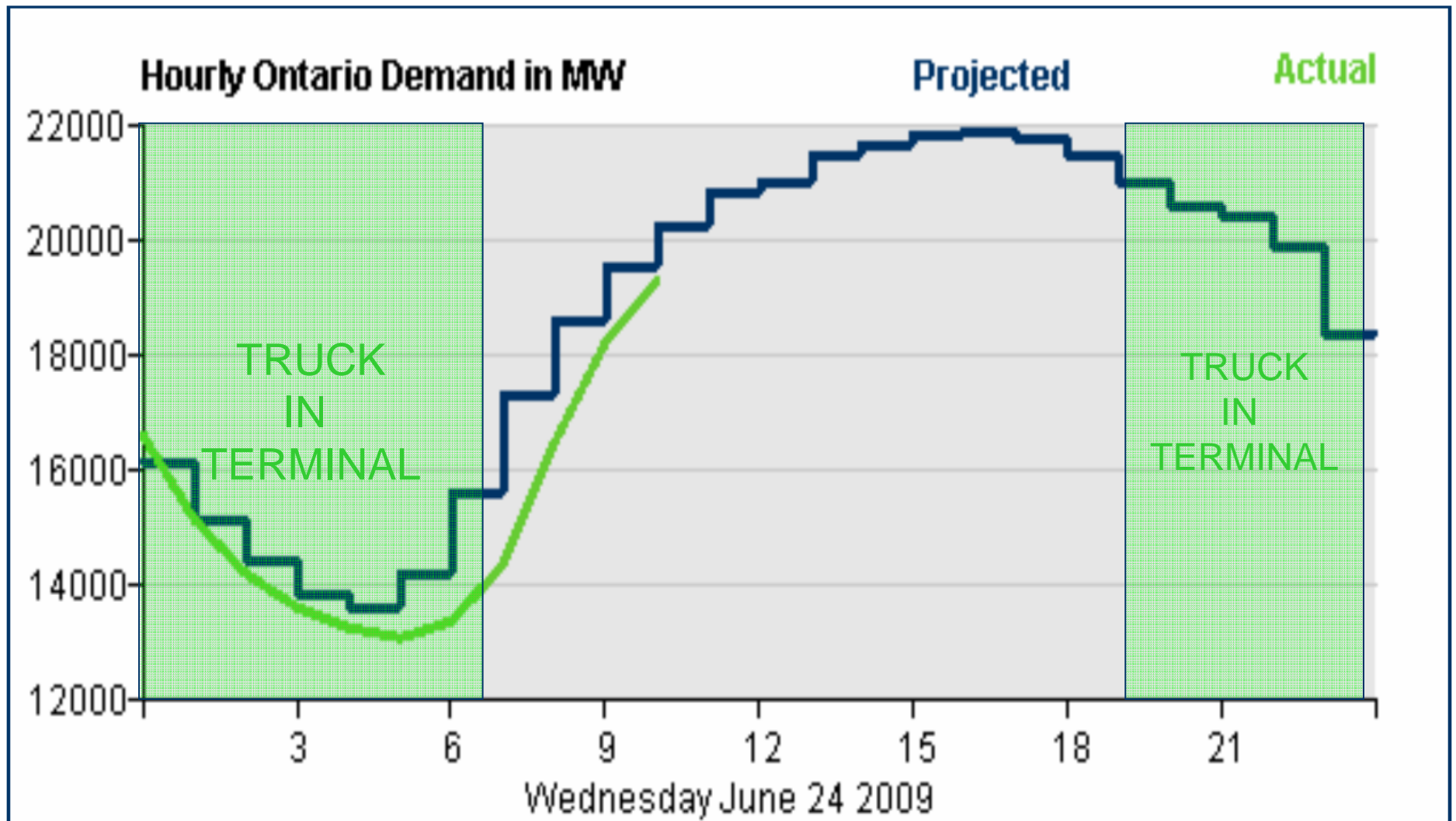
ISO 9001:2000

PUROLATOR  
COURIER LTD.

# VIDEO OF DELIVERIES, REAR AND SIDE

# Improved Ergonomics

- Low floor, kneeling, and easy entry and exit are enabled by electric drive
- These create big benefits in safety, reduction in fatigue, and improved productivity



Urban delivery is a good early application of EVs  
 Use off-peak energy at < 0.03 \$/kWh – CHEAP!  
 That's equivalent to less than 0.10 \$/litre of gas

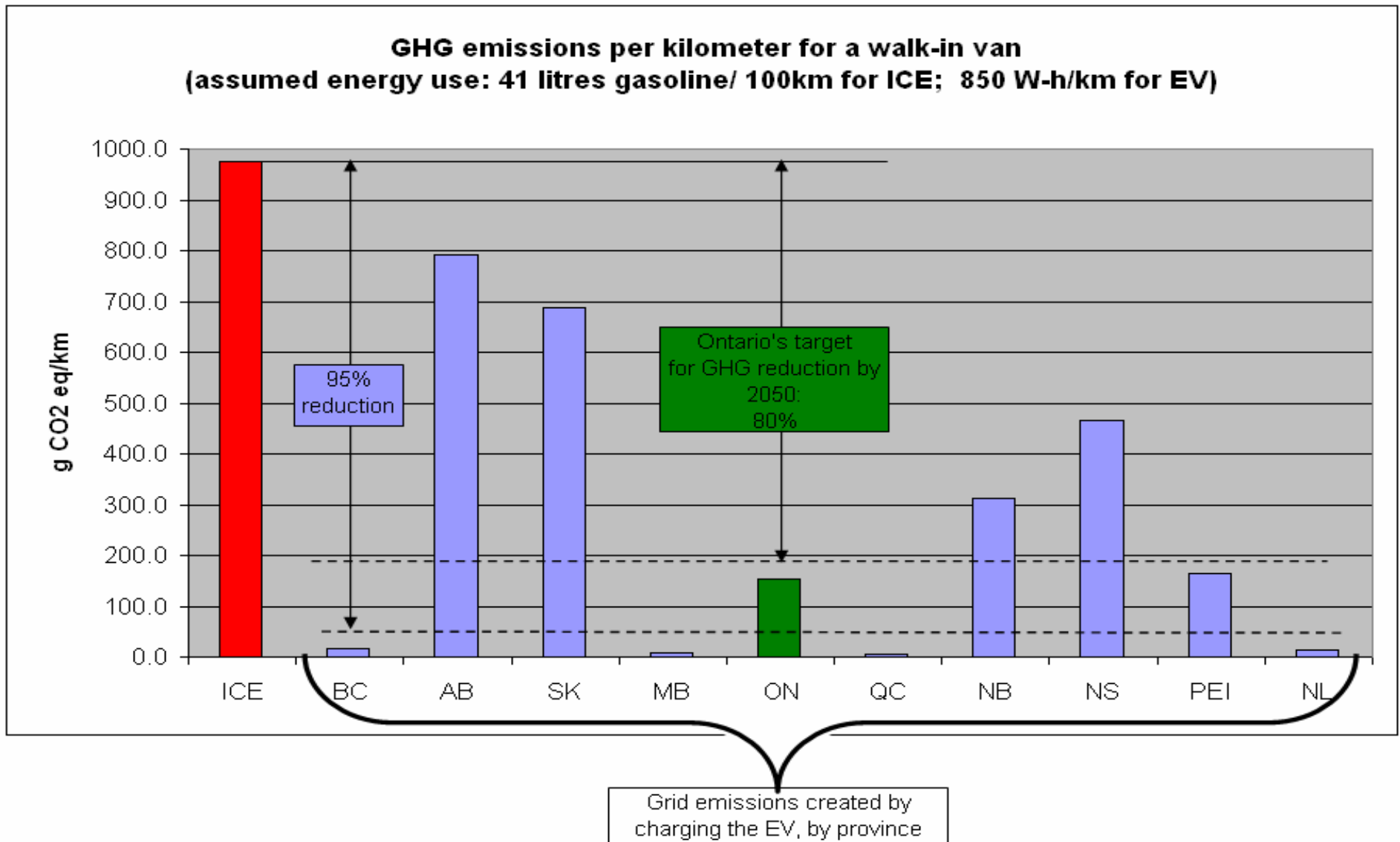
# Carbon Emissions Reduction

“Our customers are increasingly asking for the size of our carbon footprint and what we’re doing to reduce it. Increasingly, Requests for Proposals ask about this”

Serge Viola, National Fleet Director, Purolator Courier Ltd.

September 2009

# EVs can achieve large GHG reductions in Canada



# So,

- Safer
- More productive
- Cleaner
- Customers and drivers love it
- Much lower energy costs

# what's not to like?

# Vehicle Cost Premium

- Electric trucks, without their batteries, must currently sell at a premium of 50 – 100% over fossil fuel powered trucks in order to cover manufacturing costs
- This is because EV trucks and their components have not had 100 years of cost reduction
- For EV trucks, we need to develop low cost, energy efficient systems for power steering, regenerative braking, DC/DC voltage conversion, heating and A/C.

# Battery Economics

- Batteries are very expensive, 50k to 90k for this vehicle, all payable upfront, unlike gasoline, and they may not last the life of the vehicle
- Even if the battery costs are turned into monthly lease or rental payments, so they look more like fuel costs, those payments are still far too high, given current battery prices and performance

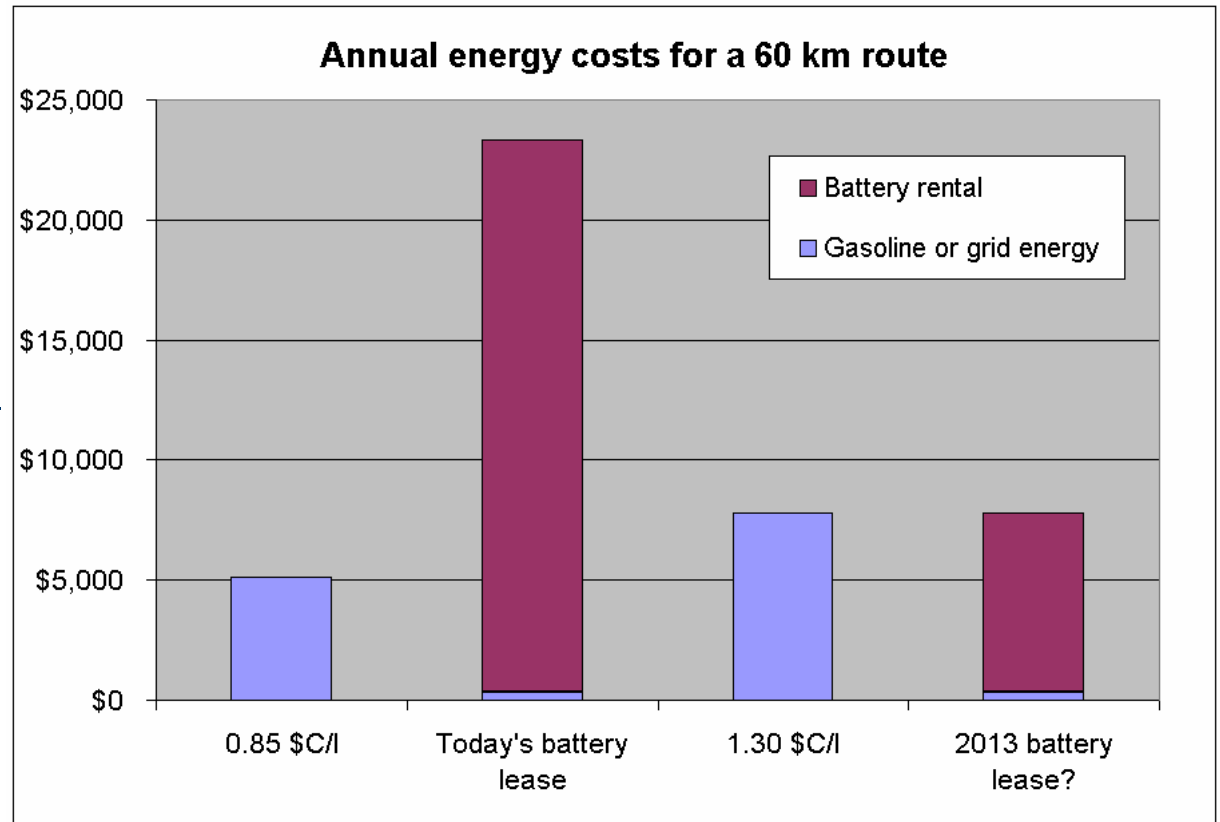
# A Couple of Annual Battery Cost Scenarios

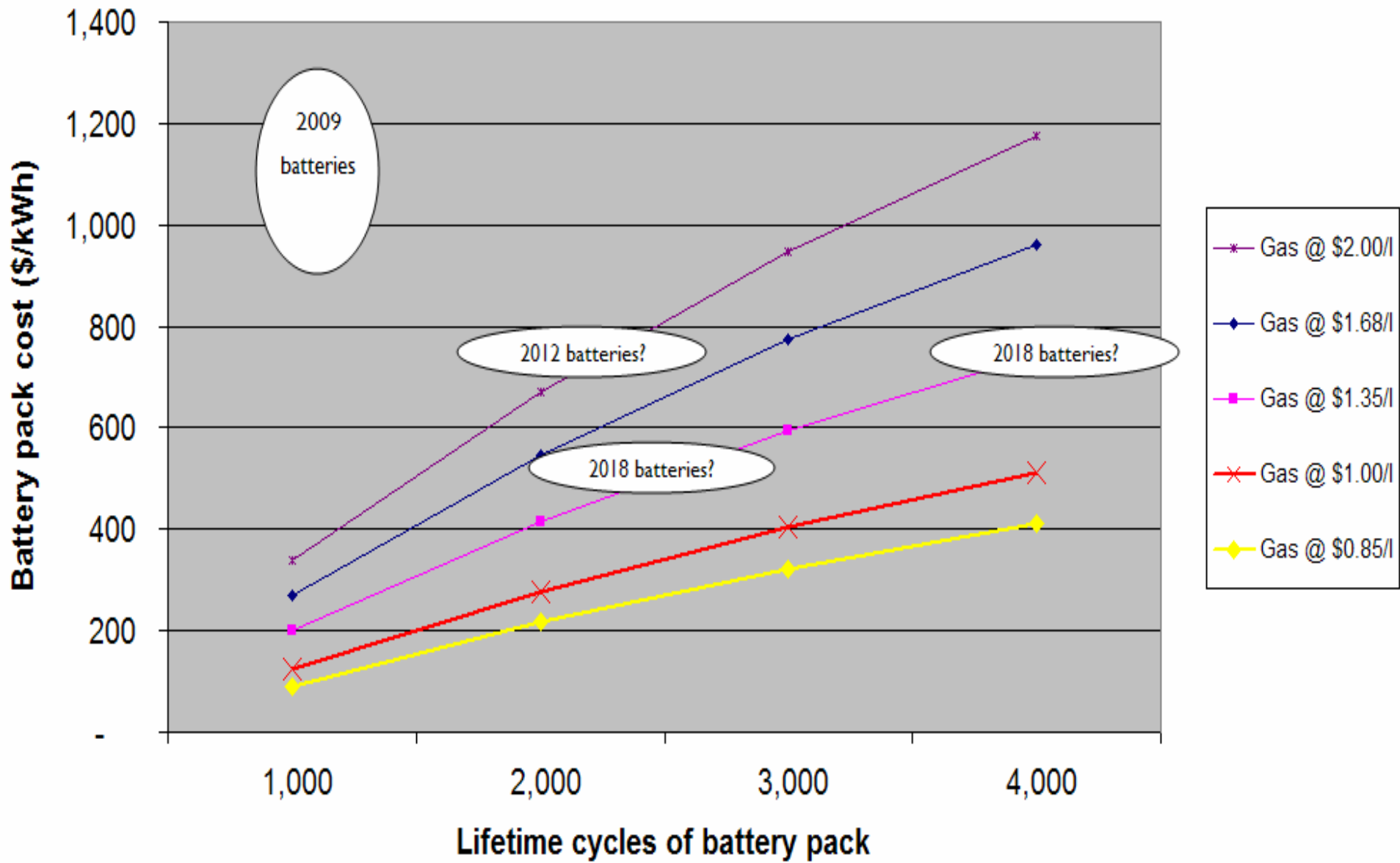
## Current battery economics

- \$1,200/kwh Pack Price
- 1,000 Lifetime Cycles
- Zero residual value

## Possible Battery Economics (2013)

- \$650/kwh Pack Price
- 1,500 Lifetime Cycles
- 50% Residual Value





So, at today's costs, the economics seem to be out by a factor of 2, and there are all sorts of new technical problems to solve.

Why bother?



We're already within a factor of 2 on economics. We can beat that with the right effort by industry, and the right “bridge financing” policies from governments.

Life on earth is at stake. Let's do it!