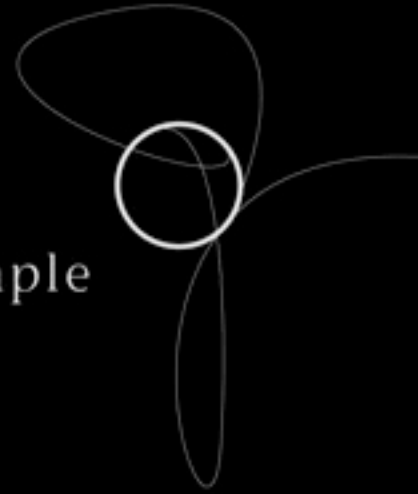


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You can't cross a chasm in two leaps

Shift Conference, by

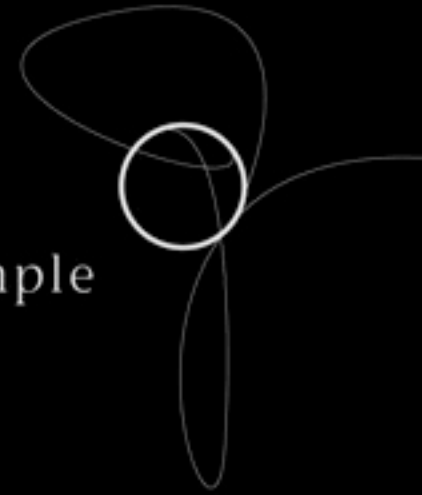
Cambridge Investment Research

www.hvm-uk.com

November 17th 2009

Hugo Spowers, Riversimple LLP

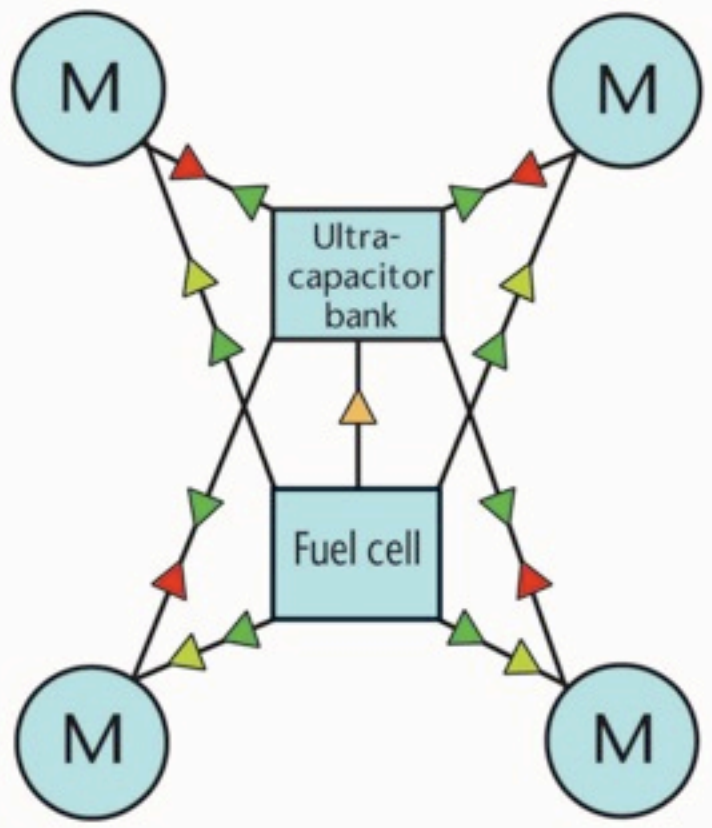




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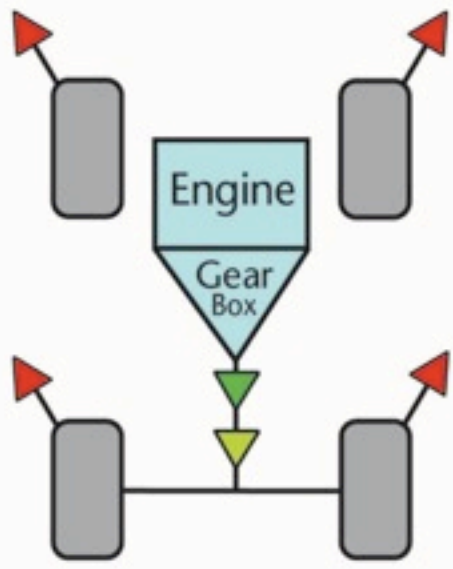
The Network Electric Platform

- Popularly perceived barriers to FC vehicles
 - Power density of fuel cells
 - Cost of fuel cells
 - Hydrogen storage density
- Conventional solutions to these barriers
 - Throw money at the FC and storage technology
 - Basic science: lots of people, money and time
 - far from market
- Systemic solutions
 - Reduce FC power and power density required, Factor 4+ each
 - Reduce hydrogen consumption Factor 4+
 - Integration of existing technology: small teams, cheap and quick
 - near to market



The network electric powertrain

- Motor
- Energy flow when braking
- Energy flow when accelerating
- Energy flow when cruising
- Energy flow when recharging ultra-capacitors



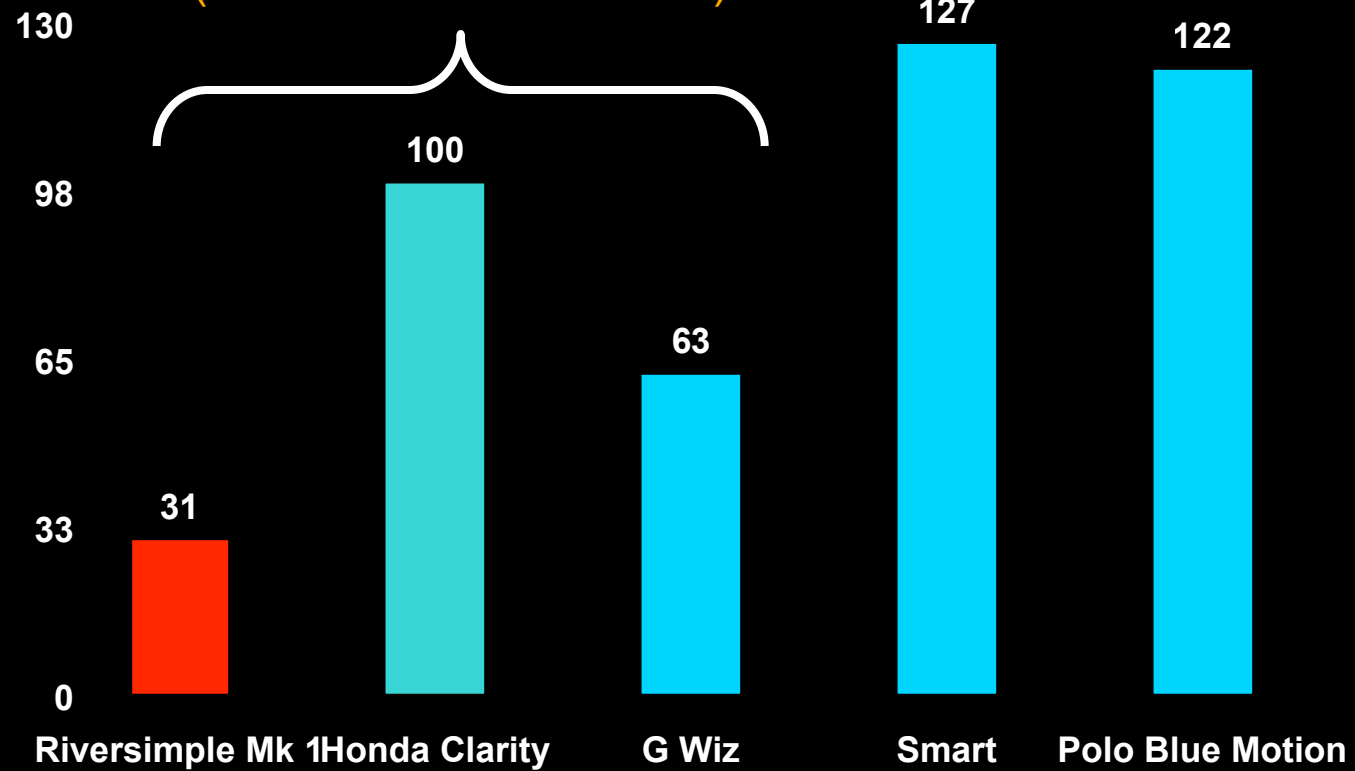
A conventional linear powertrain

Well to wheel CO₂ per km



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'Zero emissions' cars
(Natural Gas fuel source)

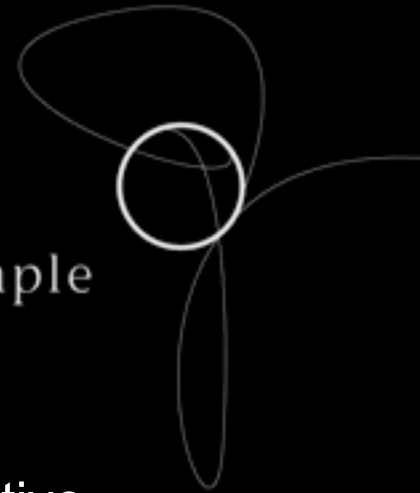




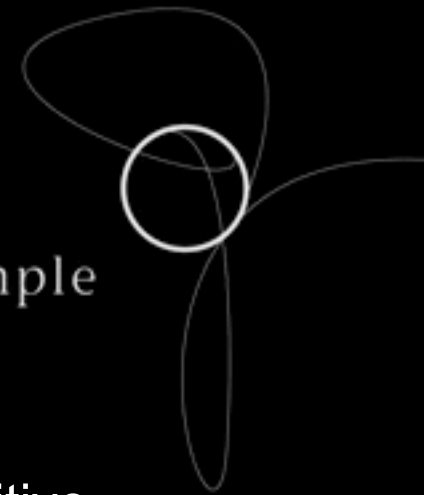


Sale of Service

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- The 'problem' of Longevity becomes a source of competitive advantage
 - 4 times as many customer revenue streams harnessed per vehicle manufactured
 - The second hand markets can be accessed
 - Cheaper for consumer - even if cost price higher and margin greater
- Revenue from every car made in previous 15 years

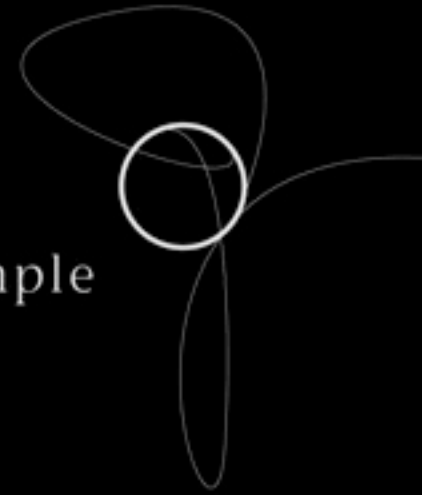


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If we need to wring the maximum utility from every unit of resource, what hope have we ever got of achieving it by rewarding the opposite?



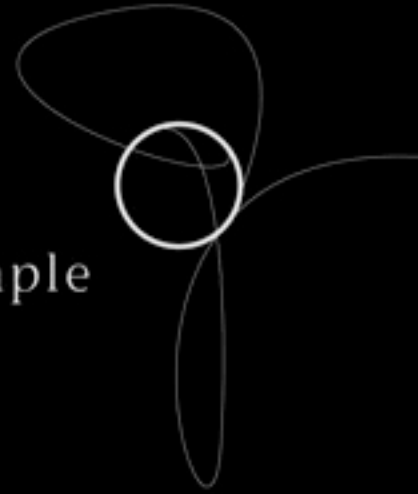
Open source design

- OS is driven **ONLY** by quality
 - Very quick at weeding out failures
 - Generates a driver for absolute excellence
 - Competition only provides a driver to be better than competitors
- Window of opportunity to establish new standards
- No conflict between OS and building brands
- Optimal blend of competition and cooperation

Linux can harness *‘a pool of creativity that Microsoft, for all its huge resources, will never be able to match’*

New Scientist

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“It is not necessary to change; survival is
not mandatory”

W. Edwards Deming

