

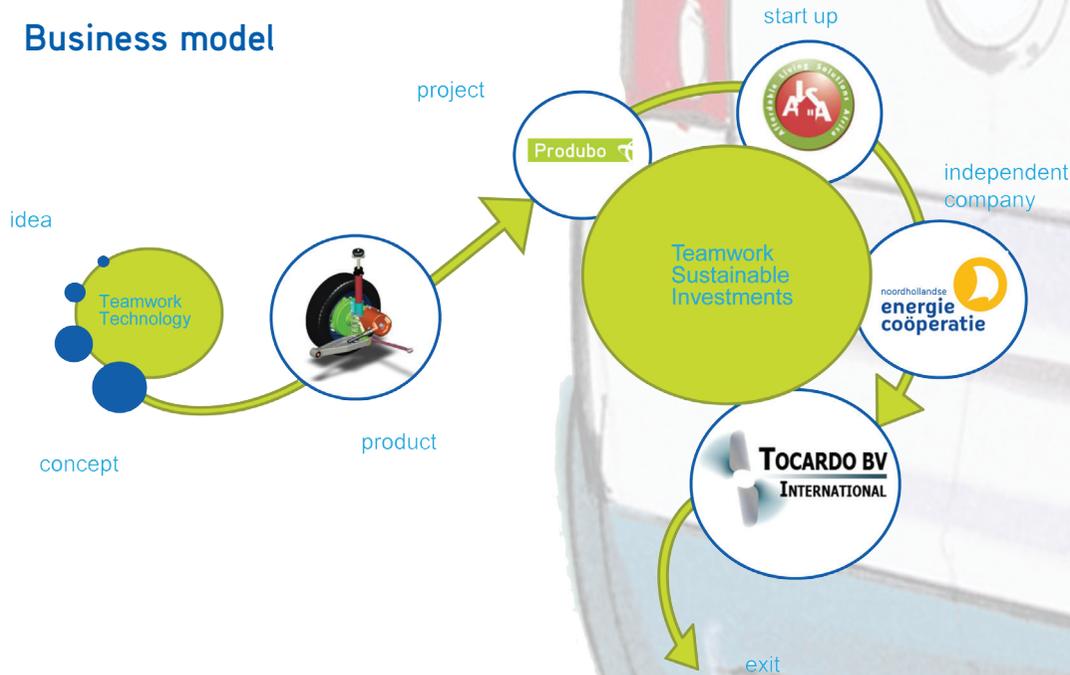
About Teamwork Technology

- Bringing new sustainable technologies and concepts to the market
- Focus on Sustainability
- Globally active
- Founded in 1993



Wheelmotor

Business model



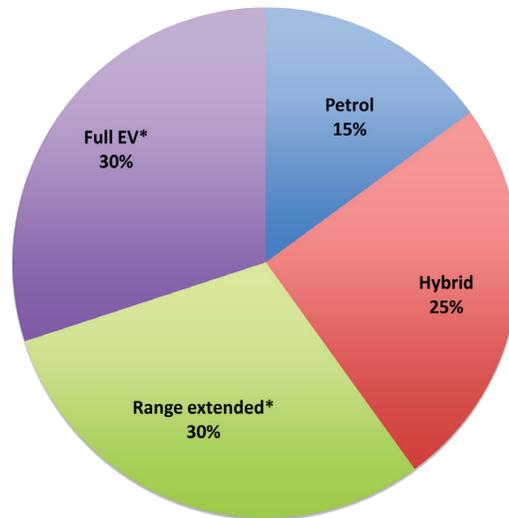
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Market opportunity

- Over the last few years OEM's in the automotive market have been increasingly interested in the development of electrical passenger cars. Many OEM's already have hybrid or fully electric cars in their portfolio.
- The following revolution in this market will be the application of inwheel electric motors, as this will bring great improvement in efficiency and production costs.
- Current worldwide market size : 57 mio cars sold in 2010. Based on conservative market growth with the electric vehicle segment, a turnover of 900,000 wheelmotors is expected in 2020 and 30,000,000 units in the year 2030. *(25% of Full EV and Range Extended vehicles is equipped with wheelmotors.)

Vision 2030: Market share different power trains



Market overview

- Several technology developers, knowledge institutes, tier-1 suppliers, and OEM's have been working on wheelmotors. Up until now none of these technologies have been applied commercially for passenger cars.
- Two typologies exist in the market: direct drive (DD) or indirect drive (ID) using a gearbox. The Teamwork design philosophy is: a cost price optimized design while meeting all technical requirements.
- The DD design can in no way compete with the ID in terms of cost price. Therefore development was focused on developing a unique ID configuration.

Proof of principle efficient light-weight wheel motor for passenger cars

- Business opportunity for radical new technology
- Dutch technology development 2008 – 2012 in close cooperation with Eindhoven University of Technology
- Working prototype with patented gearbox, meeting requirements for passenger cars

Advantages Teamwork Wheelmotor

- **Light-weight:** The smart combination of the high speed electromotor and a unique gearbox makes the wheelmotor stay significantly below the allowable weight of a wheel (un-sprung mass).
- **Freedom of design:** by integrating the electrical motor directly in the wheel, the traditional 'powertrain' is no longer needed. Flat bottoms, different weight distributions and completely free layouts become possible.
- **Higher efficiency:** leaving out the traditional 'powertrain' leads to higher efficiency.
- **Flexible and manoeuvrable:** Individual control of each wheel and combining 4-wheel drive with a sophisticated control system makes new displacements possible.
- **Cost efficiency:** In time the production of the units is calculated to converge to a cost price below 500 US\$

