



TOTAL

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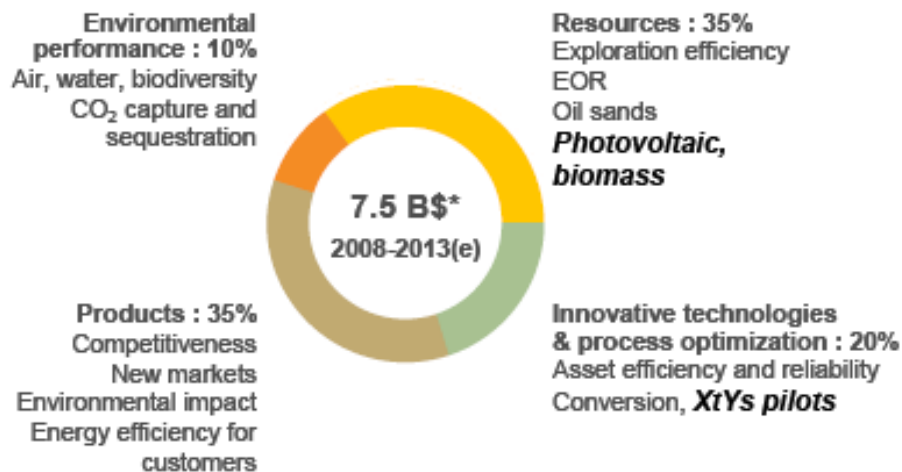
FCH JU SGA2009 – October 26, 2009

- **TOTAL** Commitment towards New Energies
 - Overview of On-going Hydrogen Activities
 - The Next Step : a required Leapfrog
 - A Pulse Story...

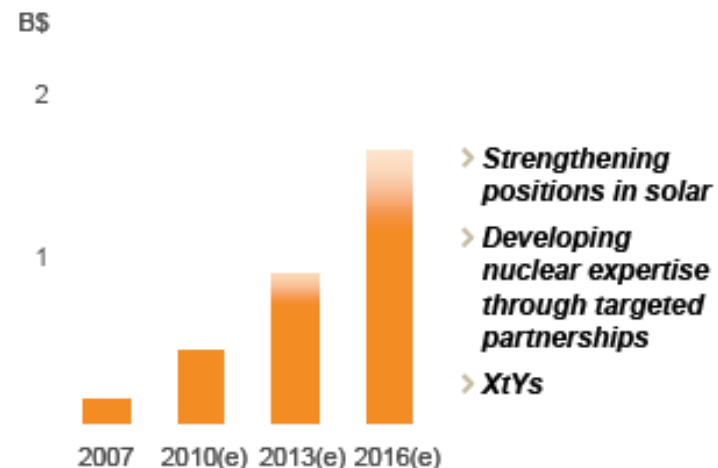


Anticipating tomorrow's needs

Increasing leverage to R&D



Capital employed in new energies



- > R&D : 1 B\$ in 2008, +20% compared to 2007 and projected to increase by 10% per year on average
- > **R&D leveraged through partnerships or capital development for new energies and environment**

Accelerating the development of core competencies in new energies

* based on 1 € = 1.4 \$

1 New Energies within TOTAL

Solar



- Strengthening positions : growth
- Integration in the Value Chain
- Provider of turn key solar solutions : multi- energy mix
- Energy provider :CSP, PV solar farms

Nuclear



- Developing competencies through selected partnerships

X to Y



- Coal to Petrochemicals (through DME)
- Biomass 2nd generation (GEVO)
- DME



A Snapshot of **TOTAL** Hydrogen Activities



HyPac Platform
HyFrance 3 WG
(French Roadmap)



FCH JU Support/Projects
NEW-IG Founding Member
H2 Prod. & Distr. AA expert



Sponsor of
UC Davis STEPS
Programme incl.
H2 Thread



HRS Developments
NIP (CEP Lead)



Technical Cooperations
With OEMs & Tier I Suppliers

Signatory of
September 10, 2009
MOU h2_mobility
(Berlin)



Focus on **TOTAL** HRS Activities

- ▶ **Early involvement in 2002 in Berlin : 1st HRS to provide CGH₂ to BVG busses.**
- ▶ **Further evaluation of H₂ distribution technologies & operation through different Demo programmes in the field so as :**
 - **To contribute to technical improvements,**
 - **To gain hands on experience on the day to day operation of HRS,**
 - **To evaluate the costs associated (CAPEX & OPEX),**
 - **To study the end-user behavior (Social Acceptance).**
- ▶ **Critical to liaise closely with H₂ vehicles providers (Alignment).**



Berlin Spandau - 2006



München Detmoldstraße - 2007

Brussels Ruisbroek - 2008





Within the framework of NIP/CEP incl. Konjunktur Packet II, **TOTAL** is committed to deploy new HRS in Germany (Pilot Region) esp. In Berlin & Hamburg as a 1st step.

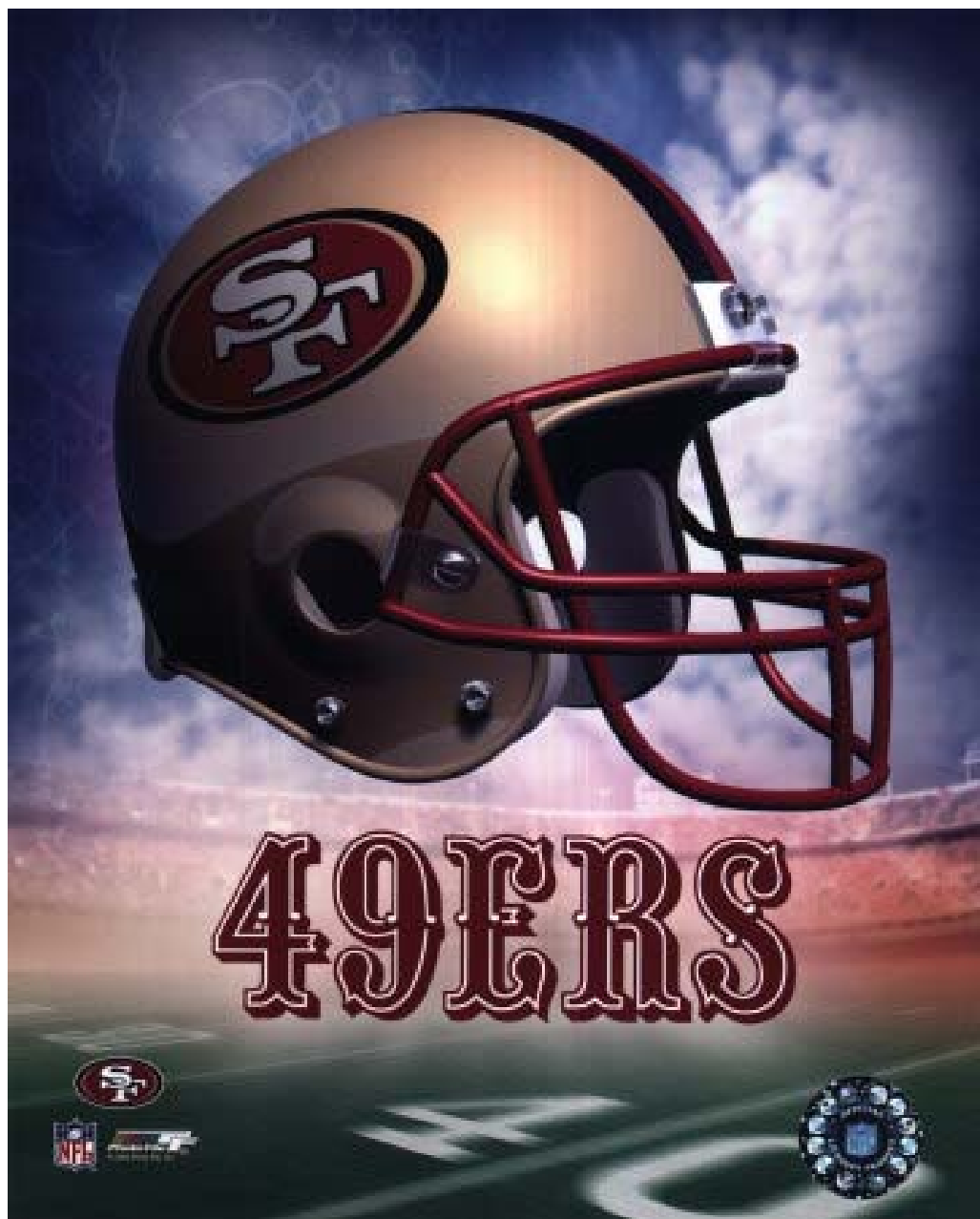


Berlin Holzmarkstraße – Q1-2010

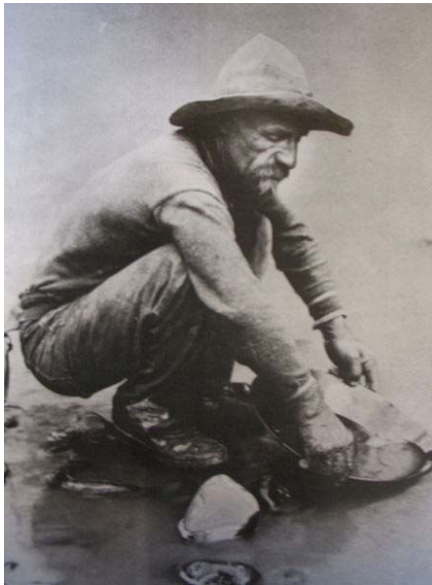
The Next Step : a required Leapfrog...

... from on-going Demo projects to pre-commercialization for Hydrogen Vehicles and Infrastructure.





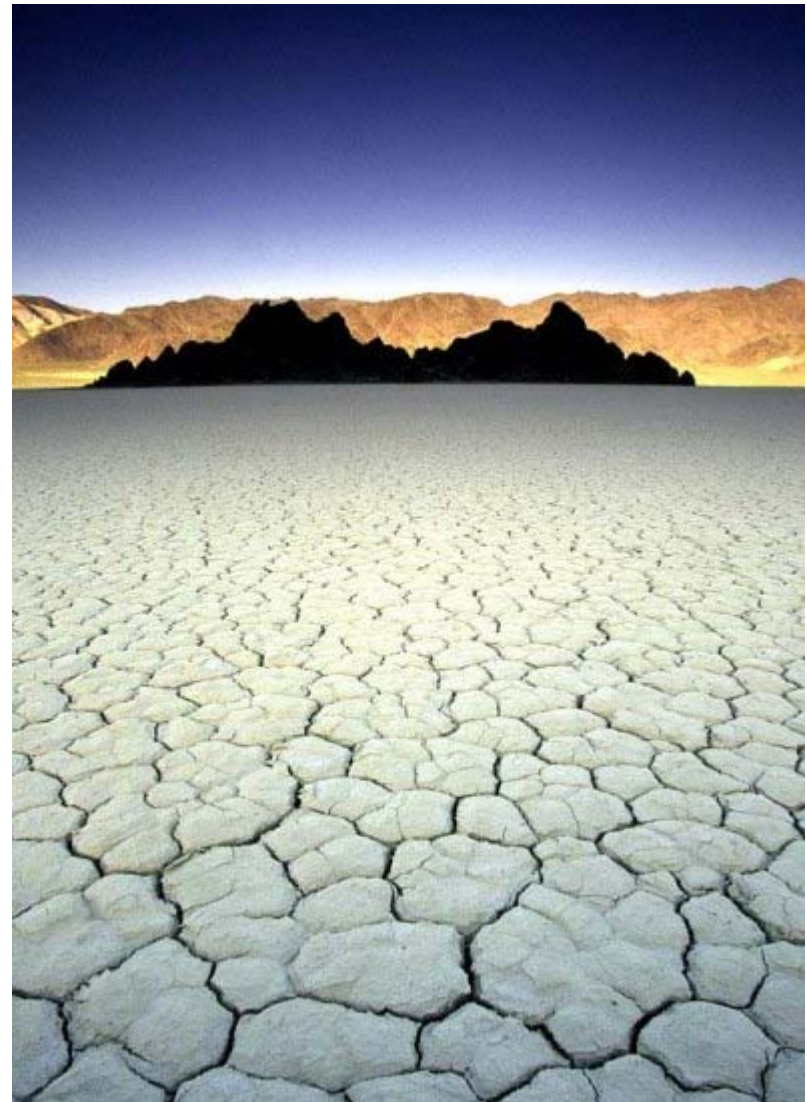
Back to History....



49er

**Faith, Courage,
Dedication,
Commitment
and...**

**A Strong
Partnership**



Crossing the Valley of Death...

a Way Forward : the h2_mobility initiative

DAIMLER

— EnBW


THE LINDE GROUP


Nationale Organisation Wasserstoff-
und Brennstoffzellentechnologie


OMV




TOTAL

VATTENFALL



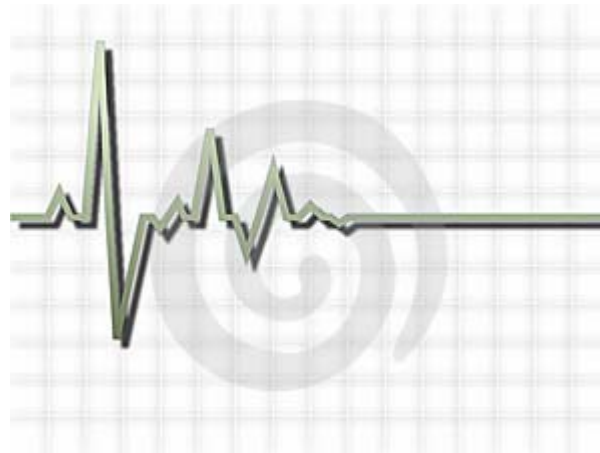
- ▶ A strong Partnership of motivated Stakeholders,
 - ▶ Germany as a Pilot Region for Europe,
 - ▶ Additional Partners are Welcomed,
-
- ✓ Leading industrial companies to agree upon a built up plan for a nationwide infrastructure
 - ✓ Significant expansion of hydrogen fuelling stations network by the end of 2011
 - ✓ Important milestone on the way to emission-free mobility
 - ✓ Leading vehicle manufacturers pursue the development and commercialization of electric vehicles with fuel cell. Commercialization with several hundred thousand units anticipated from 2015 onwards

a Way Forward : the h2_mobility initiative

“Our field experience gained over the years in siting Hydrogen Refuelling Stations in Germany has allowed us to demonstrate that hydrogen based technologies may provide a sound answer to clean mobility. A significant leapfrog for both hydrogen vehicles & infrastructure deployments is now required, and this agreement intends to achieve this ambitious target.”

Michel Mallet, Managing Director, Total Deutschland GmbH (September 10, 2009)

A Pulse Story...





But :

- No Silver Bullet to solve the Energy Equation,
- Hydrogen & Fuel Cells bring a major Contribution to a Future Clean Mobility.