<table>
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<tbody>
<tr>
<td>I. Renewable Power within Alstom</td>
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<td>II. Renewable market</td>
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<tr>
<td>VI. New Energies</td>
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<tr>
<td>VII. Conclusion</td>
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</tbody>
</table>
Renewable Power Sector creation

- Sector created in July 2011
- Agile organisation with empowerment and leaner decision-making processes

Renewable Power Sales within Alstom Group

- Renewable Power: 10%
- Rest of Alstom: 90%

Source: Alstom
### Renewable Power Sector organisation

**HYDRO**

- Comprehensive range of hydro power generation equipment and services
  - Designs to services
  - Small to large stations
  - Run-of-river to pump storage
  - Individual equipment to turnkey sites
  - New and retrofit projects

**WIND**

- Integrated wind farm solutions
  - System or key component design and manufacturing
  - Assembly
  - Installation
  - Services
  - Onshore: 1,67-3 MW
  - Offshore: 6 MW

**NEW ENERGIES**

- 3 activities
  - Renewable Steam Plants offers fuel-tailored turnkey solutions for Solar CSP (with BrightSource Energy), Geothermal and Biomass
  - Industrial steam turbines for the renewable energy markets
  - Ocean (tidal and wave)

<table>
<thead>
<tr>
<th>ACTIVITY DESCRIPTION</th>
<th>HEADCOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRO</td>
<td>~8,000</td>
</tr>
<tr>
<td>WIND</td>
<td>~1,300</td>
</tr>
<tr>
<td>NEW ENERGIES</td>
<td>~200</td>
</tr>
</tbody>
</table>

Full spectrum of Renewable Energy technologies covered (excluding PV)

Source: Alstom
Synergies with Thermal Power and Grid

**THERMAL POWER**
- Joint commercial network (Global Power Sales) with Renewable Power
- Hybrid generation technology offering combining solar with gas & coal plants (ISCC/Boost)
- Increased flexibility of product portfolio to incorporate intermittency of renewables on network (ex: GT 24/26 and KA 24/26 plants)
- Production of turbines for New Energies

**GRID**
- HVDC solutions for Offshore Wind
- Smart grids to incorporate the intermittency of renewable power generation
- Power Conversion solutions with battery storage adapted to new modes of energy production and consumption
- Network Management Solutions to manage generation resources
- Inverters for solar & wind farms
Renewable Power strategy

**Maintain leadership in Hydro**
- Keep leading technological edge
- Seize growth opportunities in terms of geographies (i.e. Russia), markets (i.e. increase presence in Service/Rehabilitation market) and products (i.e. VarSpeed Pump Storage)
- Continue strong focus on cost competitiveness and performance (Quality, On-time delivery)

**Grow Wind profitably**
- Selectively grow in onshore where Alstom has assets/presence to leverage (i.e. Brazil with existing Hydro presence)
- Develop leadership position in offshore
- Reduce product platform cost

**Capture medium term growth in New Energies**
- Leverage partnership with BrightSource Energy in Solar CSP (Tower technology)
- Become a Tier 1 company in the field of marine energy
Recent footprint developments

- GTC Opening in Sorel-Tracy
- JV with SSE in Wave
- Significant share in AWS
- RusHydro JV
- First stone St-Nazaire offshore Wind
- Acquisition of TGL
- >20% in BrightSource
- Bahia nacelle assembly Unit in Brazil
- GTC first stone in Taubaté
- Tianjin II The biggest Alstom factory in the World
- Service JV in Bhutan

Source: Alstom
Key recent commercial successes

- **Biomass Boston, USA, 50 MW**
- **Biomass Plainfield, USA, 50 MW**
- **Brazil - 24 projects, 0.8 GW**
- **Renova FA, 1.2 GW**
- **Santo Antonio do Jari, 378 MW, Brazil**
- **Iguaçu, 2.4 GW, Colombia**
- **1.4 GW offshore French Tender**
- **Ashalim concession awarded**
- **Grand Renaissance, 3 GW, Ethiopia**
- **Inga 21 & 22, 350 MW, DR Congo**
- **Tehri 1000 MW, India**
- **Lai Chau, 1.2 GW, Vietnam**

Source: Alstom
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Renewable Energy market by technology

Renewable Energy market to be primarily driven by growth in Offshore Wind and Solar CSP

- Low point in 2012 but demand expected to rebound
- Hydro New overall stable, most of growth driven by ageing & growing Installed Base
- Wind onshore nearly stable, while offshore to grow strongly
- Solar CSP to triple, geothermal and biomass expected at least to double in the next decade
- Ocean market emerging

Source: Alstom
Renewable Energy market by geography

Growth to come largely from Europe, MEA and China

- Most regions to increase
- China to sustain growth and represent almost half of the market
- Fewer very large hydro projects in LAM but more wind to come
- Europe growth driven by offshore wind

Excluding PV

Source: Alstom
Renewable Energy LCOE

Typical cost of electricity for European new plant construction

Onshore wind already within conventional technologies cost range

Source: Alstom
Order growth vs. market growth

Orders [€ million]

<table>
<thead>
<tr>
<th>Year</th>
<th>FY 10/11</th>
<th>FY 11/12</th>
<th>FY 11/12 9m</th>
<th>FY 12/13 9m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,936</td>
<td>2,026</td>
<td>1,324</td>
<td>1,218</td>
<td></td>
</tr>
</tbody>
</table>

Renewable Power market [GW]

<table>
<thead>
<tr>
<th>Year</th>
<th>9m 2011</th>
<th>9m 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

Low level of market due to project delays (permitting, etc ...)
Good resistance of the order book in a difficult market environment

Source: Alstom
Orders by geography and business

Orders by geography [FY 11/12]

Orders by business [FY 11/12]

Geographical and technological diversity allowing better resistance to specific market downturns
Sales, IFO margin and Backlog

Sales [€ million] & IFO margin [% of sales]

- FY 10/11: 1,941, IFO margin 8.9%
- FY 11/12: 2,027, IFO margin 7.4%
- H1 FY 11/12: 1,037, IFO margin 7.3%
- H1 FY 12/13: 856, IFO margin 5.7%

Backlog + awarded projects [€ million]

- Renewal Power Backlog Dec-2012: 4,133
- Offshore French Tender Round 1 award: ~2,000
- Renova Energia Frame Agreement: ~1,000

Current backlog: >2X years of sales

Source: Alstom
I. Renewable Power within Alstom

II. Renewable market

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Hydro market

Hydro market by region – New market
[Avg. GW / year; 2008-2021]

New market
- “Incentive free” and self sustainable new build market, except a few mini-hydro
- Short-term slowdown to be overcome with China resuming large projects
- China by far the largest market
- Fewer very large projects in LAM, but still a strong market
- Pump-Storage to increase in Europe & China

Installed Base
- Need for rehabilitations driven by ageing Installed Base (NAM, Europe, Russia & CIS)
- Growing IB and increasing trend for O&M outsourcing pushing for a solid service market
- Half of the overall Hydro Market in value coming from IB

Strong Hydro market potential in both New build & Retrofit

Source: Alstom
Zoom on Pump-Storage technology

How does a Pump-Storage Plant work?

Key benefits

- Increase in grid stability
- Optimisation of power plant fleet and electrical network infrastructures
- High cycle efficiency (~80%)
- Quick response for peak load energy supply
- Environmentally friendly

Source: Alstom
Alstom Hydro installed base market share

World IB = 1,060 GW

ALSTOM
Installed base activity accounting today for ~20% of Hydro sales with significant growth potential

*ALSTOM supplied Turbine or Generator

Half of the Hydro Market in value driven by Installed Base
Alstom has #1 Hydro fleet - ~30% of World Installed Base*

Source: Alstom
## Recent commercial successes in Hydro

<table>
<thead>
<tr>
<th>Region</th>
<th>Location</th>
<th>Capacity (MW)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAM</td>
<td>Ituango, Colombia</td>
<td>2,400</td>
<td>8x300 MW Francis, November 2012</td>
</tr>
<tr>
<td></td>
<td>Baixo Iguacu, Brazil</td>
<td>350</td>
<td>3x119 MW Kaplan, December 2012</td>
</tr>
<tr>
<td>ASIA</td>
<td>Lai Chau, Vietnam</td>
<td>1,200</td>
<td>3x400 MW Francis, December 2012</td>
</tr>
<tr>
<td></td>
<td>Dong Nai 5, Vietnam</td>
<td>150</td>
<td>2x77 MW (Turbines+Generators), January 2013</td>
</tr>
<tr>
<td>EMEA</td>
<td>Grand Renaissance, Ethiopia</td>
<td>3,000</td>
<td>8x375 MW Francis, June 2012</td>
</tr>
<tr>
<td></td>
<td>Mapragg and Sarelli, Switzerland</td>
<td>100</td>
<td>Generators Refurbishment, 2x50 MW, October 2012</td>
</tr>
</tbody>
</table>

Total: 2,750 MW (LAM) + 1,350 MW (ASIA) + 3,100 MW (EMEA) = 7,100 MW

Leadership position reinforced in a difficult new build market environment

Source: Alstom
Alstom Hydro industrial base

**CANADA**
- Tracy, Hydro
- Since 1950’s
- Turbines + Generators

**FRANCE**
- Grenoble, Hydro
- Since 1917
- Turbines

**SWITZERLAND**
- Birr, Hydro
- Since 1960
- Generators

**CHINA**
- Tianjin, Hydro
- Present since 1995
- Turbines + Generators

**BRAZIL**
- Taubaté, Hydro
  - Since 1956
  - Turbines + Generators
- Porto Velho, Hydro
  - Since 2010
  - HME

**SPAIN**
- Bilbao, Hydro
- Since 1930
- Generators

**RUSSIA**
- Ufa

**BHUTAN**

**INDIA**
- Baroda, Hydro
- Since 2004
- Turbines + Generators

**GOOD MARKET COVERAGE IN KEY HYDRO REGIONS**

**Manufacturing sites**

Source: Alstom
Partnership with RusHydro

AlstomRusHydroEnergy (JV)

• JV announced in a strategic cooperation agreement in December 2010 with a mission to produce hydropower and auxiliary equipment in Russia

• Shareholders Agreement signed in June 2011 to establish the JV (50% - 1 share for Alstom)

• Ufa factory: part of AlstomRusHydroEnergy JV, to be managed by Alstom

• JV to employ over 500 people by 2015

• Strong potential, notably for large refurbishment works

Unique opportunity to expand in Russian and CIS markets

Source: Alstom
Alstom Hydro products & services offering

BULB
- Head: 3 – 25 m
- Max. Diameter: 8 m
- Axial flow
- Horizontal axis
- Output < 80 MW

KAPLAN
- Head: 10 – 50 m
- Max. Diameter: 11 m
- Axial flow
- Vertical axis
- Output < 250 MW

FRANCIS
- Head: 30 – 800 m
- Runner dia. < 10.6 m
- Tangential inlet flow, axial outlet flow
- Vertical or horizontal axis
- Output < 1,000 MW

PELTON
- Head: from 10 to 1,200 m
- Reversible single, double or multi-stage centrifugal units
- Axial, mixed or centrifugal flow
- Output < 500 MW

PUMP TURBINE
- Head: 200 – 1,800 m
- Runner in air
- Tangential jet inlet
- Vertical or horizontal axis
- Output < 350 MW

OTHER
- Small, medium and large generators (up to 1,000 MVA)
- Hydro Mechanical Equipment (valves, gates, penstocks, lifting equipment, pipes, pumps)
- Control systems (>250 references)
- Balance of Plant, Electrical/Mechanical engineering/systems

Full spectrum of the hydro market covered

Source: Alstom
Adapting to market environment

- Price pressure since 2010 with some limited recent signs of stabilisation
- Rationalisation of the European footprint launched, starting with the grouping of most French Hydro engineering and support activities in Grenoble
- Initiatives launched to optimise the full hydro cost base: focus on sourcing, product management, engineering, manufacturing, reduction of non quality costs and S&A
- Continued investment in R&D/Innovation with technical centres in Grenoble (turbines) and Birr (generators) and regional outfits in all worldwide production locations

Ongoing cost optimisation to deal with challenging market environment and progressively improve margin levels
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Wind market

Onshore
- Tightening market & overcapacity
- Local content requirement in emerging markets (Brazil, Morocco, Saudi Arabia, South Africa, ...)
- Repowering opportunities in mature markets (Germany, USA, Spain)
- Push for larger & more efficient products (high towers, large rotors)
- Wind O&M market size growing (x3 by 2021)

Offshore
- Europe (UK, North Sea, France) & China on the forefront of offshore developments
- Few players with ready-to-market products

Offshore to drive market growth, local opportunities in Onshore

Onshore Wind market by region
[Avg. GW / year; 2008-2021]

Offshore Wind market by region
[Avg. GW / year; 2008-2021]

Source: Alstom
Wind market current dynamics

Increase in overcapacity in 2012
- Uncertain/revamped renewables support policies (e.g. Spain, Italy, UK, USA)
- Tight financing conditions

Local content requirement in new countries (Brazil, Morocco, KSA, RSA,...) likely to contribute to global capacity build-up

Supply-demand gap expected to narrow thanks to increasing demand and decisions to take some capacity out

Overcapacity still putting pressure on prices but some recent stabilisation observed
Alstom well positioned to address Wind market

**Fit with Alstom’s core competencies**
- Designer-integrator business
- Innovation business
- Increasing technological content
- Strong project management competencies
- Developing service activity

**Success factors**
- Global commercial network
- Access to a broad range of Utilities clients worldwide
- Strong global mastery of technology at the heart of Alstom’s know-how (generators with/without gearboxes, control systems, ...)
- Basis for a global service network
- Synergies with Alstom Grid, particularly in HVDC activities
- Leverage Hydro commercial and operational footprint

**Evolution of wind turbine characteristics**

Source: Alstom
Alstom’s traditional customers active in Wind

- Two primary client types: large Utilities and IPPs, both traditional Alstom customers
- Large Utilities looking to optimise their energy portfolio and progressively increasing their market share at the expense of IPPs
  - working with a limited number of “preferred suppliers”, often within the context of multi-year “frame agreements”
  - requiring global suppliers with adapted local products, local industrial presence and service network, etc...

Added Wind capacity in the USA & Europe [by client segment type]

Cumulative wind capacity of the main players [end 2011]

Alstom’s traditional Utilities/IPP customers also active in Wind with growing ambitions

Sources: IHS, Alstom
Strategy in Wind

1. **Develop leadership position in Offshore**
   - Top technology available in the market
   - Good platform with French tender
   - Opportunities in Europe and beyond

2. **Grow selectively in Onshore**
   - Focus on LAM with strong volume growth
   - Selective expansion in new markets (e.g. North Africa, South Africa, Middle East, Japan), leveraging on Alstom’s local presence and customer contacts

3. **Focus on competitiveness**
   - Cost optimisation with continuous efforts on sourcing, engineering, manufacturing, quality, project execution, etc...

### Historical Alstom Wind Orders by geography

- **4 yrs ago**: 100%
- **1 yr ago**: 53%
- **Today**: 52%

**Source**: Alstom
Industrial footprint in Wind

**USA onshore**
- Nacelles (800 MW)

**BRAZIL onshore**
- Nacelles (600 MW)
- Towers (120 units)

**FRANCE offshore**
- Nacelles (proto, pre-series)
- Nacelles (600 MW)
- Generators JV (600 MW)

**SPAIN onshore**
- Buñuel – Nacelles (1,500 MW)
- Altamira – Towers (150 towers)
- Somozas – Cabinets & Extenders

Wind industrial footprint prudently sized, expected to develop based on order intake

Source: Alstom
Haliade-150: a technological edge in the market

- **Simple**
  - increasing reliability whilst lowering maintenance
    - Direct drive (few moving parts, low rotation speed, proven technology)
    - Permanent magnets (no excitation of rotor required, less electrical parts)

- **Efficient**
  - Large rotor giving higher yield (+15% vs. current generation)

- **Robust**
  - Generator rotor receiving only PURE TORQUE®
    - Separation between the main rotor and the generator rotor protecting the drive train and increasing reliability

Product roadmap

Source: Alstom
Offshore French tender – Round 1

- Three zones awarded in April 2012 to a consortium led by EDF (Alstom, Dong Energy, Nass & Wind and WPD Offshore): Saint-Nazaire, Courseulles-sur-Mer and Fécamp

- Alstom exclusive turbine supplier to EDF for these orders worth over €2 billion (240 turbines)

- Orders to be booked over 2-3 years starting in FY15/16

- Related revenues to be booked over at least 5 years starting in FY15/16

- Industrial plan with the setup of 4 factories for a total investment of ~ €100 million
  - Production ramp-up starting in 2014

- Announcement by the French Government in January 2013 of the Round 2 offshore tender for ~1 GW (two wind farms) with tender awards expected January 2014
Offshore opportunities worldwide

**UK**
- Current offshore capacity YE11: 2.1 GW
- Total of 48 GW allocated between 2001 and 2010 for development in Rounds 1, 2, 3, Round 2 extension and Scottish Territorial Waters
- N. Ireland Offshore rounds (600MW) ongoing
- Target of 18GW by 2020
- Preparing bids for 10.3 GW

**Germany**
- Current offshore capacity YE11: 200 MW
- 8 GW of consented capacity at YE2011
- Target to add 10GW by 2030
- Preparing bids for 850MW

**Belgium**
- Current offshore capacity YE11: 200 MW
- Target of 2 GW by 2020

**Poland**
- Preliminary development permits granted in 2012 to five projects for total 4.5GW

**China**
- Current offshore capacity YE11: 400 MW
- 1GW awarded in 2010 in Jiangsu stalled
- Uncertainty around 2nd round of offshore concessions (1.5-2 GW)
- Progress on offshore demo projects launched by local governments (e.g. 5.6 GW in Hebei)
- Target of 30GW by 2020

**Denmark**
- Current offshore capacity YE11: 860 MW
- 400 MW Horns Rev III tender to be unveiled in 2013

**Japan**
- Current offshore capacity YE11: 30 MW
- New energy strategy for 8GW offshore by 2030
- Promotion of floating technology

**Targeting a number of opportunities primarily in Europe, but also globally**

*Source: EWEA*
Commercial success in Brazil for Wind Onshore

- Brazilian wind market expected to be ~2GW / year through 2020
- Entry in the Wind market in Brazil leveraging a strong historical presence through Hydro
- Key successes:
  - First project: 96 MW Brotas, installed in 2011
  - ~300 MW under construction
  - ~400 MW additional contracts signed recently
  - Frame agreement with Renova Energia for 1.2 GW

Recent successes in Brazil validating a selective growth strategy

Successes in Brazil [MW; 2010 – 2013 YTD]

- 2010: ~100 • 57 x ECO86 (1.67 MW)
- 2011: ~200 • 41 x ECO86 (1.67 MW) • 36 x ECO86 (1.67 MW) • 35 x ECO86 (1.67 MW)
- 2012: ~500 • ~20 projects • 190 x ECO122 (2.7 MW)
- 2013 (ytd): 1,200 (Mainly ECO122 (2.7MW))

Total: ~800 | 1,200 | ~2,000

Orders | Renova Frame Agreement

Source: Alstom
Renova Energia: the largest wind power generation company in Latin America

Signature of a Frame Agreement (FA) between Renova Energia and Alstom for the supply of 1.2 GW of Wind turbines (mainly ECO-122)

FA part of a larger plan for Renova Energia (~2.4 GW until 2020)

Projects to be developed in the Bahia interior region, the #1 wind region in Brazil which represents ~45% of the market

Commissioning expected to take place in 2015 through 2018

Key components to be sourced locally

Sources: Alstom, UTM
ECO-122 well positioned to capture future growth

- Complements our product offering for low-wind sites
- **High power**
  - Rotor diameter of 122m
  - Nominal power of 2.7 MW
- **Higher Capacity Factor**: up to 42% or over 3,600 hours per year
- **Land optimisation**: up to 25% increased wind farm yield compared with today’s 1.5-2 MW turbines
- **CAPEX optimisation**: 10-15% lower balance of plant cost
- **Increased reliability**: PURE TORQUE™ transmitting only the torque to the drive train for higher reliability

**Product roadmap**

- **2011**: Offering
- **2012**: First unit
- **2013**: First commercial wind farm

Source: Alstom
Adapting to market environment

- Reduction in platform costs to deal with pressure on market prices
- Increased volumes, particularly in LAM, allowing for greater economies of scale
- Optimisations made in design & process as well as manufacturing, transport and installation
- Additional restructuring actions necessary to adapt the European operational footprint to the reality of the market

Key competitiveness focus areas

- Key savings expected in blades, welded structure, converter, gearbox and generator
- Focus on tower weight reduction, drive train reduction

Source: Alstom
## Agenda

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Solar CSP market

Solar CSP market by technology
[Avg. GW / year; 2008-2021]

Mid-term outlook

- Tower technology with the largest growth potential
- Storage-based CSP technology becoming dominant segment, supported by feed-in tariff (FIT)
- Hybrids (subject to regulation) gaining momentum mid-term (ISCC, Boost)
- MENA, USA, South Africa, India main markets for CSP

Tower CSP with storage to become the leading thermal solar technology

Source: Alstom
Tower technology overview

1. Software-controlled field of heliostats concentrate heat on a boiler mounted on a central tower.
2. Solar receiver (boiler) converts concentrated sunlight into steam.
3. Turbine: The steam powers a generator and produces electricity.
4. Electricity is transmitted to the grid.

Sources: Alstom, BrightSource Energy
## Solar technology comparison

<table>
<thead>
<tr>
<th>Technology</th>
<th>Utility Scale Experience</th>
<th>Bankable</th>
<th>Storage</th>
<th>Value chain</th>
<th>Localisation</th>
<th>Hybridisation potential</th>
<th>LCOE</th>
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</thead>
<tbody>
<tr>
<td>PV</td>
<td>✓</td>
<td>✓</td>
<td>(✓)</td>
<td>(✓)</td>
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<tr>
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<td>(✓)</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Tower</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>

- **PV**
  - High efficiency today, with potential for further efficiency improvement
  - Low specific costs vs. Through (less piping, flat mirrors)
  - Highest thermal storage effectiveness
  - Most suitable for large scale hybridisation
  - Large scale projects >125MW under construction and bankable technology
  - Growing differentiation vs. PV considering dispatchability
- **Parabolic Trough**
  - Limited operational experience to date
- **Linear Fresnel**
  - Expensive
  - Limited synergies
- **Dish**
  - To be proven
- **Tower**
  - Short-term only

### LCOE evolution

- 2018 expected LCOE evolution

**Sources:** Bloomberg New Energy Finance, Alstom estimations
Partnership with BrightSource Energy (BSE)

BrightSource

- Founded in 2006, ~300 employees worldwide
- Development and building of large-scale solar steam and power generation plants
- Headquartered in California, with technology teams in Israel
- Developing 400MW solar tower project to start in Q2 2013 (Ivanpah)

Alstom total investment in BSE $170m – owning currently >20% of shares

- A number of technological and commercial agreements
  - Development of 250MW subcritical SRSG (Solar Receiver Steam Generator)
  - Preferred Equipment Supply Agreement for SRSG & STG
  - Geographical commercial and business development agreements (i.e. India, MEA, China, Australia)

Zoom on Ashalim project

- **Solar Field**: 55,000 heliostats
- **Tower height (incl. receiver)**: 240m
- **Area**: 3.15 km²
- **Nominal Capacity**: 110 MWe (126 MWe max)
- **Yearly Electrical Output**: 305 GWh/year
- **Integrated Gas boiler**: 100 tons of steam/hour
- **Concession agreement signed in December 2012** (25 year PPA for 100% output)
- **Financial Closing expected**: December 2013
- **Construction schedule**: 34 months
Global Market to reach ~1 GW per year in 2020
- Tidal to dominate and first to come
- Wave technology taking off later (no technological convergence yet)

UK to lead the market, followed by France
- UK: Feed-in-tariff in place, leased sites for 1 GW of Tidal & 0.6 GW of Wave
- France: call for tender expected by 2015

Beyond Europe
- Multi GW potential in Canada
- Potential in Korea, India, Indonesia, and to a lower extent Philippines and Japan

Ocean energy expected to reach ~1 GW p.a. by 2020 – European tenders expected soon
## Acquisition of Tidal Generation Limited (TGL)

### Two types of design
- **Simple design:**
  - finally tending to have more technical issues (heavy) resulting in higher costs
- **Optimised design:**
  - ensuring high performance, preferred by most technology developers (incl. the ones having produced electricity on the UK grid)

### Impact of TGL acquisition
- Time-to-market shortened to benefit from upcoming tenders
- In-house technology upgraded

### TGL securing technological leadership position in Tidal

<table>
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<tr>
<th>Full scale prototype (≥1MW)</th>
<th>Optimised design</th>
<th>Concept</th>
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<tr>
<td>Voith (1MW)</td>
<td>MCT (Siemens) (2 x 0.6MW)</td>
<td>TGL (1MW)</td>
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<td>Atlantis (1MW)</td>
<td>Hammerfest (Andritz) (1MW)</td>
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<tr>
<td>OpenHydro/DCNS (2 x 0.5MW)</td>
<td></td>
<td>Alstom</td>
</tr>
</tbody>
</table>

- **Simple design:**
  - Fixed blades
  - Fixed yaw
  - Sometimes a duct

- **Optimised design:**
  - Blades with variable pitch
  - Flow tracking system

*Source: Alstom*
TGL technology overview

Better hydrodynamic performance
- Uses unidirectional blades rather than bidirectional blades

Better capacity factor
- Variable pitch blades to control rotor speed, loads, and power

More cost efficient and easier maintenance
- Buoyant nacelle, allowing turbine to be towed to and from the foundation site
- Detachable from tripod for easy maintenance
- Ability to yaw to any heading

More cost efficient and easier installation
- Lightweight structure, installed using Dynamically Positioned (DP) vessels from Oil & Gas industry
- Attached to the seabed using piles
- Able to accept different sized turbines

Rated power: 1MW
Rated velocity: 2.7m/s
Rotor diameter: 18m
Nacelle length: 22m

Easier installation & maintenance allowing better performance and lower operation costs

Source: Alstom
I. Renewable Power within Alstom

II. Renewable market

III. Financials

IV. Hydro

V. Wind

VI. New Energies

VII. Conclusion
Conclusion

• Ambition to grow in profitable Renewable Energy segments
  – Build on Hydro worldwide leadership and generate more Service revenues
  – Succeed in Offshore Wind industrial and commercial ramp up

• Pursue selective growth in Onshore

• Improve cost competitiveness and operational performance across the product lines

• Prepare longer term profitable growth in New Energies by building offering portfolio

Expected rebound of operating margin from current low point