Challenges, cost-efficiency and growth potentials of European hydropower companies

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Challenge – value creation of European hydropower companies

Cost-efficiency – Uniper’s transformation and competitive advantage

Growth – opportunities in emerging markets
Declining revenues and increasing regulatory obligations require hydro operators to focus on cost performance.

Market challenge:
- Deteriorating market prices
  - Day ahead market *NordPool*¹
    - 50 EUR/MWh → 16 EUR/MWh
  - Day ahead market *EPEX*¹
    - 45 EUR/MWh → 30 EUR/MWh

Non-market challenge:
- Increasing regulatory demands
  - EU WFD (ecoflows, fish protection & migration)
  - Environmental Legislation (habitats, Natura 2000, floods)
  - Climate Change (increased variability, extreme events)
  - Intl. Sustainability Standards (cumulative ESIA)

Managerial challenge:
- Levers for value creation
  - Revenue Increase
    - Higher production through upgrades and new build
    - Development of new "products"
    - Increase of energy prices
  - Cost Reduction
    - Decrease of O&M costs
    - Increase of productivity
    - Performance-oriented leadership

1) Average base load prices in July 2010 vs. July 2015
WFD = Water Framework Directive, ESIA = Environmental and Social Impact Assessment
Uniper proactively accepted the challenge,…

Installed capacity: 1,948 MW

Annual generation: 5 TWh

ROR = Run-of-river
RES = storage plant (reservoir)
… transformed its German hydropower business and increased its cost competitiveness by up to 30%

Unprecedented power price decline in Germany requires entrepreneurial response

Tailored application of novel, internally developed tools address performance gaps

Organizational measures and change create significant value in challenging times
To then also create growth opportunities, hydro firms should leverage their expertise in emerging markets.
In general, investors scanning the market for cash-flow generating hydropower plants face three challenges:

**First challenge:** Safeguard engineering quality and international ESG requirements
- Intl. technical engineering standards and expertise

**Second challenge:** Access to hydro investment opportunities in key markets
- IFC Performance Standards

**Third challenge:** Manage asset portfolio from a technical point of view
- Due Diligence
- Project development
- Owner's engineering
- Asset management

ESG = Environment, Social, Governance
A reliable partner addresses these challenges, reduces risks and creates significant value in hydro investments.

**Advisory Services**
- Worldwide provision of in-depth expertise to clients in the fields of development, execution, rehabilitation, acquisition and divestment of hydropower assets.

**Joint Ventures**
- Development of greenfield hydropower projects together with local partners in emerging markets from site identification until financial close.

**Asset Management**
- International management and portfolio optimization of individual or groups of hydropower plants under operation on behalf of the owners.
Ideally, the business activities demonstrate a clear link to key stakeholders, i.e. development banks and incumbents.

Hydropower potential assessment of 200+ dams:
- Project ranking study
- GHG evaluation report for final options
- High-level presentation for Government of Indonesia

Project development of 42 MW Hasang HPP
- Run-of-river, 275 GWh/a
- Feasibility study, ESIA, site investigations
- Successful collaboration with local partner

3-year hydropower capability building program
- Class-room and onsite training in both Indonesia and Germany
- Development of tailor-made hydro-specific curriculum
- Case-study-based learning approach
In short, cost-efficiency, their unique expertise and owner’s perspective enable EU hydro firms to also grow overseas.

European hydropower firms will successfully grow in emerging markets in the fields of **advisory services, joint ventures** for greenfield project developments, and **asset management**, if they **understand the regulatory environment**, **contribute** their **in-house expertise**, build a strong relationship with a **local partner**, manage the projects’ **sustainability performance** and commit **financial resources and people**.
Backup
Uniper Hydro Germany secures its business future through "Destination 2020"

**Vision**

Uniper is the leading operator of hydropower plants.

**Mission**

Uniper produces electricity from hydropower in a reliable, economically viable and competent way.

**Leading operator of hydropower plants perceived positively by the public and within the Uniper Group due to:**

<table>
<thead>
<tr>
<th>Reliability</th>
<th>Economic viability</th>
<th>Competence</th>
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<tbody>
<tr>
<td>2. Ensure plant safety and protection against high water levels</td>
<td>6. Minimise costs</td>
<td>10. Demand commitment, loyalty and flexibility</td>
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<tr>
<td>3. Ensure compliance with statutory requirements and the law</td>
<td>7. Optimise asset availability</td>
<td>11. Optimise employee and organisational structures</td>
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<td>4. Create transparency and promote information sharing</td>
<td>8. Maximise revenues</td>
<td>12. Live feedback culture, encourage openness and appreciation</td>
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**Main stakeholders**

- **The public**
- **Investors**
- **Employees**

Reasons for the leading operator status:
- **The public**
  - Ensure high health & safety and environmental standards
  - Ensure plant safety and protection against high water levels
  - Ensure compliance with statutory requirements and the law
  - Create transparency and promote information sharing

- **Investors**
  - Secure long-term business continuity: renew concessions, retain asset values, drive expansions
  - Minimise costs
  - Maximise revenues

- **Employees**
  - Promote technical, methodical and personal development
  - Demand commitment, loyalty and flexibility
  - Optimise employee and organisational structures
  - Live feedback culture, encourage openness and appreciation
Introduction of Hydropower Evolutions GmbH

We are a distinguished **Hydropower Development & Advisory Firm** operating worldwide

Hydropower Evolutions serves distinguished clients, provides hydropower expertise to investors and develops greenfield hydropower projects in collaboration with partners in emerging markets.

- Unique Engineering and Asset Management know-how from an operator’s & investor’s perspective
- Subsidiary of Uniper, operator of 180 hydro plants totalling 5 GW in Europe
- 120 years of operational, maintenance and sustainability experience
- Strong global expert network and references, including IFC/World Bank, KfW and Indonesian PLN
- Management team with track record in business transformation and production responsibility for 5 TWh/a
- Co-developer and advocate of the Hydropower Sustainability Protocol for effective Risk Management
- Successful developer of hydropower projects in Indonesia since 2010
Breaking up the established utility business model leads to multiple entry points for emerging market projects

**Business rationale**

- **European operators** have decades of experience in developing, constructing and operating hydro assets.
- Capital constraints limit the ability to tie up money for long time in operation → less capital – more value
- Further cash constraints reduce the investments in new build activities → less cash, less capital – (still) more value

In addition:
- All previous business opportunities remain possible for the future

**Corporate resources**
- Networks: >1,000 → Very low
- Expertise: <500 → Low
- Cash: <100 → High
- Capital: <80 → High

**Potential projects**
- High
- Medium
- Low
- n.a.

**Capital/cash requirements**
- High
- Low
- n.a.

**Risks & rel. returns**
- High
- Medium
- Low
- n.a.

**No. of investors**
- Few
- Many
- n.a.

**Milestone**
- Identify (ongoing)
- FID = Financial Investment Decision
- COD = Commercial Operating Date

**Option/potential future scope**
- New focus – less capital – more value
- Option/potential future scope
Detailed analyses of crucial business aspect underline the viability of the business concept.

Components and Analyses of the Business Concept

- Strategic Fit ✔
- Business Case & SWOT ✔
- Product, Pilot & References ✔
- Markets, Clients & Competitors ✔

Hydropower Evolutions GmbH
To benefit from each stage in the lifecycle of hydropower projects a fund model approach can be applied

**Development Fund**

Early stage investments of seed capital in promising hydro project candidates with the aim to develop them from “greenfield” to “bankable” and sell them at market multiple benchmark to the Implementation Fund.

**Project investment criteria:**
- Approved by local government and PPA counterparty
- Principle development and location permits in place
- Positive technical, sustainability, and legal due diligence

**Implementation Fund**

Equity investments in concrete hydro projects ready to be constructed with aim to implement them from “bankable” to “COD” and sell them at market multiple benchmark to the Operation Fund.

**Project investment criteria:**
- FS, ESIA, EPC contract(s) ready for implementation
- All necessary permits in place
- PPA signed

**Operations Fund**

Acquisition of completed hydro plants ready to be operated with aim to take them from “COD” to “reliable operation” and create a unique portfolio delivering a steady and secured fixed income at a low risk level.

**Asset investment criteria:**
- Asset management in place
- Commissioning successfully completed
- O&M team trained

PPA = Power Purchase Agreement, FS = Feasibility Study, EPC = Engineering Procurement Construction, O&M = Operations and Maintenance
Hydropower Evolutions developed a sophisticated and compliant investment approach and process.

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**Project Screening**
- Personal networks
- In-house database
- Conferences
- Agents

**Due Diligence**
- Technical
- Sustainability (ESG)
- Commercial
- Legal

**Risk Management**
- Life-cycle-orientation
- Value-driven
- Across all disciplines
- In-house developed tools

**Portfolio Management**
- Performance management
- Benchmarking
- Problem-solving
- Countermeasures

**Asset Valuation**
- Macroeconomics
- DCF calculations
- Market multiples
- Audited by a Big-4

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**Characteristics**
- Candidate long list
- Project short list
- Acquisition priorities
- Risks and opportunities
- Financial viability
- Cash-flow requirements
- Continuous control
- Investment oversight
- Operational management
- Balancing risks
- Managing timing/maturity
- Adjusting the portfolio
- Determining fair value
- Fulfilling legal requirements
- Communicating progress

**Result**
- Quarterly Market Report
- Stakeholder Map
- Contact Database
- Hydropower Database
- Project Ranking and Prioritization (pipeline)

**Deliverables**
- Due Diligence Reports
- Investment Decision Papers
- Quarterly Project Risk Management Reports
- Quarterly Project Performance Reviews
- Quarterly Portfolio Performance Report
- Quarterly Asset Valuation Reports
Your partner in emerging markets

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