SHP COMEBACK IN LATIN AMERICA

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I. INTRODUCTION
II. LARGE VS SMALL HYDRO
III. ELECTRIC ENERGY CURRENT STATE IN LATIN AMERICA
IV. PROSPECTIVE LOOK
V. SHP FOSTERING TECHNOLOGY DEVELOPMENTS
VI. CONSTRAINTS TO SHP DEVELOPMENT
VII. CONCLUSIONS

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INTRODUCTION

1. History of Hydroelectric Potential Development in LA
- Started with construction of SHP stations
- Preference for Large Hydro
- Large Hydro Feasible Potential Reduction

2. Climate Change

3. Revival of Small Hydro

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LARGE VS SMALL HYDRO

1. Large Hydro Compared to Small Hydro
2. Hydropower in Latin America
3. Assessment of Small Hydropower Potential

LARGE HYDRO COMPARED TO SMALL HYDRO

Component/ Criteria	LHP	SHP
Civil Works	Large, Complex	Small, Simple
Environmental Impact	Significant (Resistance)	Marginal (Aceptable)
Social impact	Marginal	Significant
Equipment Basic Criteria	Efificiency, relibility, quality	Robust, simple, available
Energy Transmission	Large high Voltge Lines	Short Medium / Low Voltage Circuits
Financial Issues	Large Investments Sophisticated Analysis	Modest Investments Simple Analysis
Basic Goal	Economic Profit	Social Profit
Objective Customer	Industry, Commerce	Residential, Rural

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HYDROPOWER IN LATIN AMERICA

1. Installed Hydropower Capacity:

México, Central America and the Caribe		16.000 MW
South América (excluding Brazil)		70.000 MW
Brazil:		84.000 MW
Total Installed Capacity:		170.000 MW
2. Estimated technically feasible hydro potential	>	500.000 MW

3. Small Hydro

SHP share of Installed capacity (excl Brazil)	<	5%
Estimated SHP potential		xxx

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SHP POTENTIAL ASSESSMENT

Assessment Difficulties

- Lack of SHP specific data in many countries
- Scarce and inaccurate documentation
- Still many untapped potential sites
- Different size criteria to define SHP

Main Reference: SHP World Report from ICSHP

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ELECTRIC ENERGY CURRENT STATE IN LATIN AMERICA

1. Still low electric energy coverage in rural areas
2. Economic growth leading to electricity supply shortages
3. Many countries highly dependent on fossil fuels
4. Increasing awareness of climate change

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PROSPECTIVE LOOK: LARGE HYDRO

1. Today Outlook
- World feasible potential largely developed
- Still many potentially attractive sites in LA

2. Short Term: Fast Growth
- Increased construction of new power stations
- Upgrading of existing stations

3. Medium Term: Slow Pace. Higher costs due to:
- Technical difficulties
- Environmental impact and mitigation needs

4. Long Term: Stop construction of new sites
- Technically, Economically and Environmentally feasible sites exhausted.

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PROSPECTIVE LOOK: SMALL HYDRO

1. Today Outlook

- SHP potential still largely untapped
- Construction unit costs still higher than for Large Hydro

2. Short Term: Growing interest, due to:

- Climate change
- Fossil fuels increasing costs

3. Medium Term: Application of modern technologies, leading to:

- Shorter construction times
- Lower construction unit costs

4. Long Term: Accelerated development. SHP most important RES due to:

- Availability
- Efficiency
- Reliability

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SHP FOSTERING TECHNOLOGY DEVELOPMENTS (1)

1. Sites identification, evaluation and mapping

2. Civil Works

- Intake Structures
- Conduction Channels
- Dams and Pressure Tanks
- Inflated Weir
- Siphon

3. Penstock new materials

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SHP FOSTERING TECHNOLOGY DEVELOPMENTS (2)

4. Mechanical Equipment

- Classical Turbines
- Cross Flow Turbines
- Axial Flow Turbines
- Zero Head Turbines
- Ecobulb Turbines
- Centrifugal Pumps

5. Generators

6. Supervision and Control Systems

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CONSTRAINTS TO SHP DEVELOPMENT

1. Electric power systems expansion model
2. Design methods and construction processes
3. Government policies and legal framework
4. Regulatory framework
5. Environmental regulation

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CONCLUSIONS

1. Large Hydro development slowing down and approaching the end
2. Small Hydro development cycle stepwise rising
3. LH and SH construction cost curves closing the gap
4. LH vs SH: the wrong dilemma
5. Electricity supply still lagging behind demand
6. Modern technologies foster SHP development
7. Constraints to SHP development need to be eased
8. Climate change awareness leading to new energy paradigm in Latin America

THANKS FOR YOUR ATTENTION

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