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APPLICATION OF A PHASE MODEL FOR THE SUSTAINABLE TRANSFORMATION OF LEBANON´S SYSTEM

The Phase Model provides an overall framework which structures the process of energy transition over time through the differentiation of a set of subsequent phases of the transition process.

THE FOUR PHASES IN THIS MODEL INCLUDE:

Take-off Renewable Energy

Phase 1: 0-20% renewable electricity share

- Visions and expectations for the expansion of RE-based energy generation are developed.
- Developments in assessing regional potential, local pilot projects.
- Market introduction of RE drawing on globally available technology and driven by global price drop of RE
- Extension and retrofitting of electricity grid
- No replacement of fossils due to growing

System Integration

Phase 2: 20-50% renewable electricity share

- At this stage, flexibility potentials (Demand-side Mangement, storage) are recognized, and the electricity market design is adapted to accommodate these options.
- Progressing digitalization of the energy system.
- First PtF/G applications are tested under local condition.

Power-to-Fuel/Gas

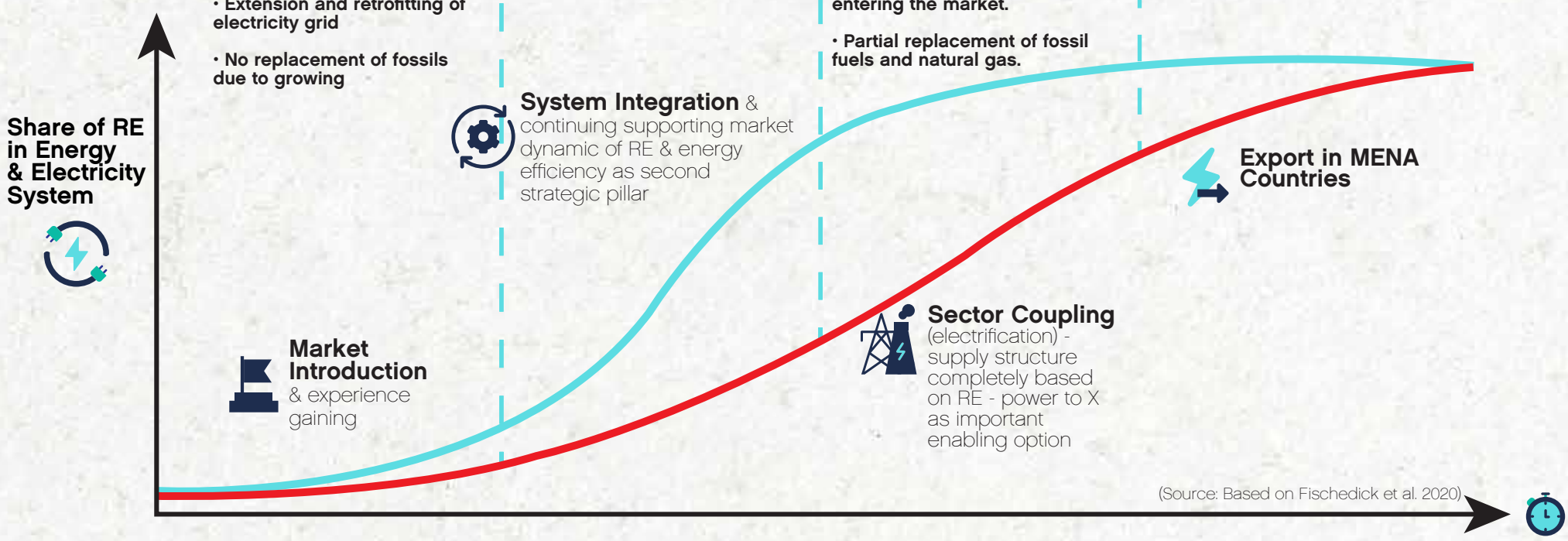
Phase 3: 50-80% renewable electricity share

- The share of renewables increases in the electricity mix, leading to intensified competition between renewables and fossil fuels and – temporarily – to high, negative residual loads.
- Green hydrogen and synthetic fuel production become more competitive due to the availability of low-cost electricity.
- PtF/G, supported by regulations including pricing schemes, are entering the market.
- Partial replacement of fossil fuels and natural gas.

Towards 100% Renewable

Phase 4: 80-100% renewable electricity share

- Fossil fuels are phased out
- PtF/G is fully developed in terms of infrastructure and business models.
- As support for renewables is no longer required, price supporting schemes are phased out.
- Export market structures are expanded and constitute a crucial sector of the economy.



(Source: Based on Fischedick et al. 2020)

WHERE DOES LEBANON STAND?

	Niche level before phase 1 (Take-off)	Phase 1: Take-off	Niche level before Phase II (system integration)
Supply	Assessment for RE Potential	RE does not replace fossil feuls	Assessment of regional potentials of different flexibility options
Demand	Local experiments with RE	Fundamental recognition that energy efficiency is the second strategic pillar of the energy system transformation	Effort to accelerate efficiency improvements; Experiments with flexibility options
Infrastructure		Extension & retrofitting of electricity grid; Transnational efforts for grid expansion	Exploration of business models around flexibility including ICT startups & new digital business models for sector coupling
Market/ Economy	Development of visions for RE extensions	Market introduction of RE; Regulations & price schemes for RE	Development of visions for flexmarket & energy system integration (regional & transnational energy markets)
Society	Formation of RE related actor networks	Increasing awareness of environmental issues	Formation of actor networks around flexibility across electricity, mobility heat sectors

Completed | In-Progress/Planned | Next Steps

Information included in this infograph are extracted from the report: Sustainable Transformation of Lebanon's Energy System, Development of a Phase Model available here

According to the MENA phase model, Lebanon can be classified as being in the early stage of the first phase of the energy transition towards renewables.