

A Strategic View of Green Power & Energy Efficiency:

Establishing an Integrated Energy Strategy & Program



Africa GPM Regional Working Group
Accra, Ghana
07 November 2012

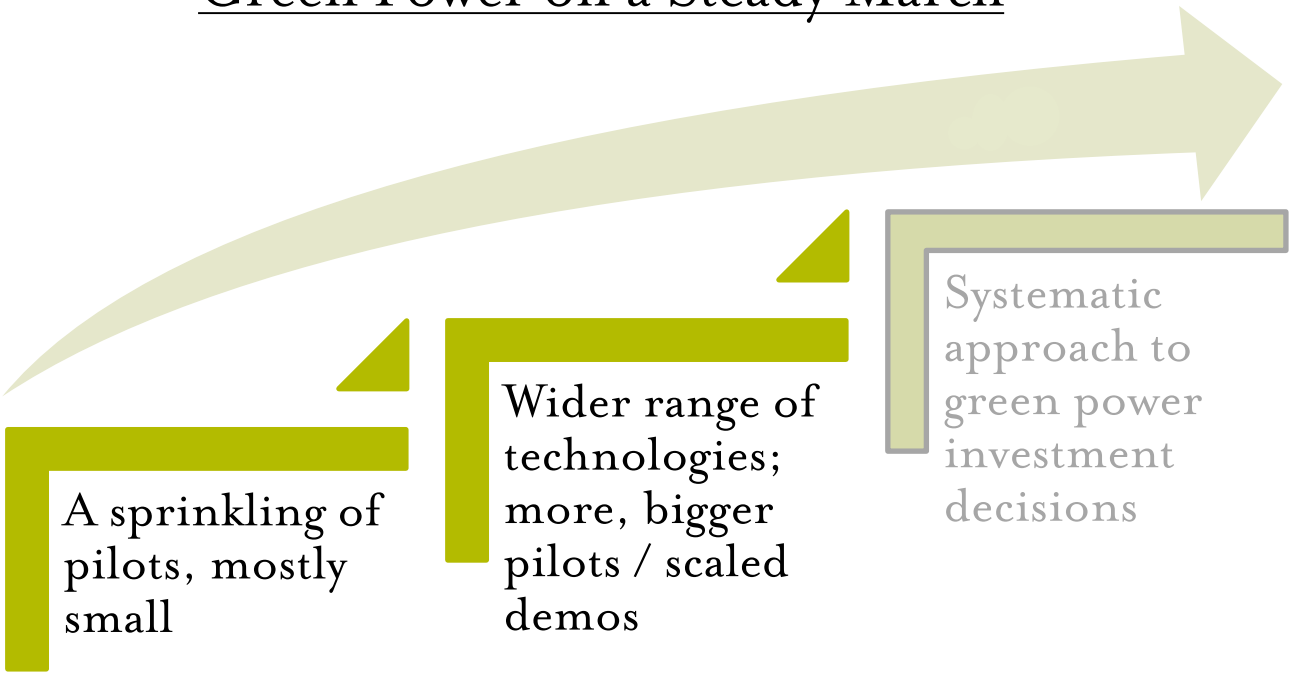
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Executive Summary

- Energy innovation, green and otherwise, is making inroads; key is to catalyze and broaden uptake
- Energy was an afterthought during past network expansions resulting in today's legacy costs
- Innovative energy programs have the potential to increase operating margins by 3 to >10%
- While TCO is now a primary focus, power optimization is a multi-dimensional challenge
- "Cross-pollination" of pockets of expertise between telecom and energy sectors facilitates adoption
- Energy Program design starts with an assessment of the commercial strategy and business objectives
- Dispersed nature of investments requires integrated procurement from strategy to operations
- Comprehensive monitoring and scorecard measurement keeps energy front of mind
- Integrated approach involves:
    - Analysis and strategy formulation
    - Energy program roadmap design
    - Monitoring and calibration

Green / Hybrid Energy: Showing traction with ever more telco deployments; challenge is to expedite and broaden uptake

Green Power on a Steady March

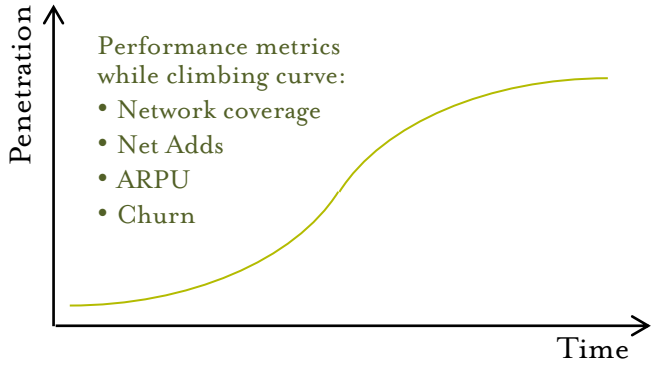


Though green power is gradually moving up the MNO priority list, outside a few pockets of scaled deployments and the unique case of China, there is still some distance to travel before realizing global mainstream adoption

** IFC / GSMA Bi-Annual Report July 2012, "Phase of GPM Market" category*

Energy as an Afterthought: While always important, energy efficiency was a secondary priority during initial network deployments

Industry originally driven by Capex focus; Energy costs a legacy



Driving factors:
- Acquisition through coverage
- Deployment speed
- Accumulating licenses
- Falling device costs
- Deployment / Capex efficiency

Network energy costs - an opportunity for margin growth

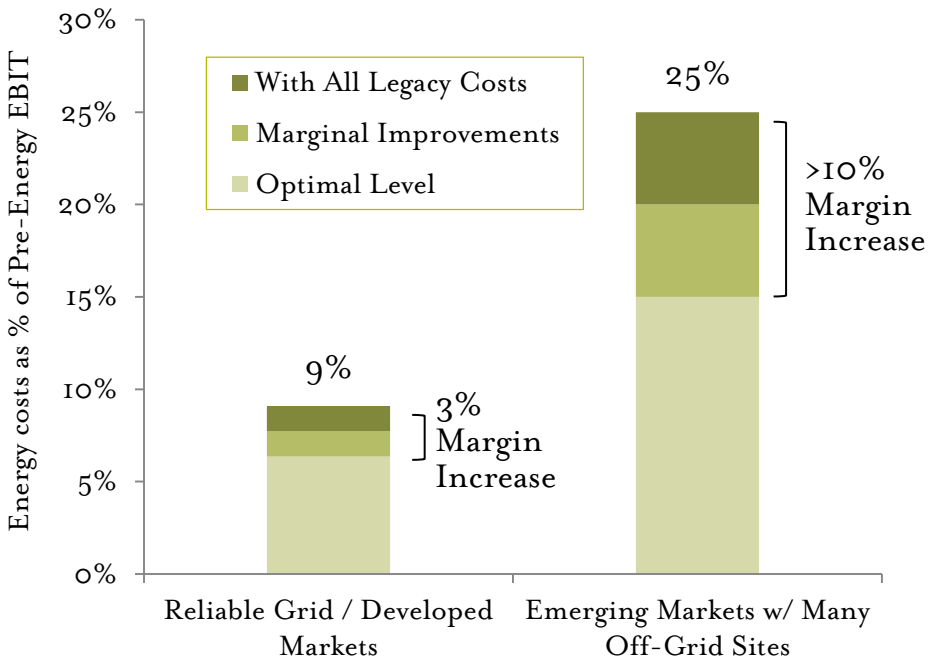
	Lower Bound	Upper Bound
As % of Network Opex	15%	50%
Margin opportunity	**-3%**	**->10%**

Source: HIP Consult analysis of sample of MNO financial data GSMA

- Initial growth focused on quickly expanding geographic coverage, capacity
- Revenue driven – strategies optimized coverage for a given Capital budget
- Price competition now pressuring margins; costs need to adjust
- Energy efficiency is a relatively unaddressed area for improvement

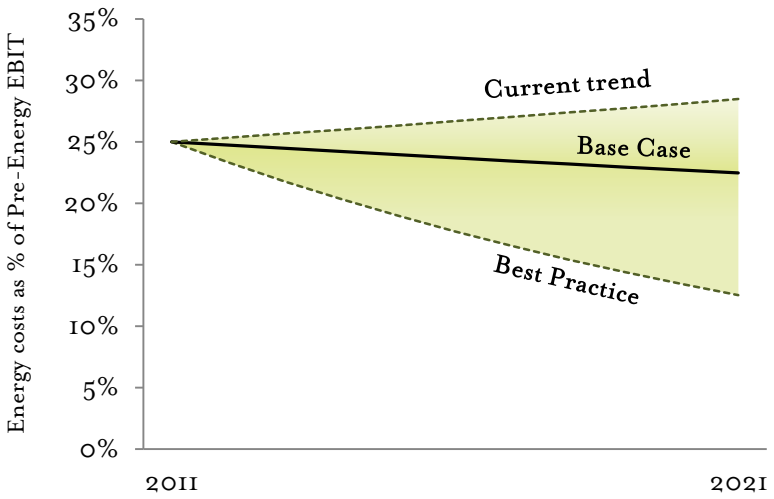
Margin Impact: Energy costs present a relatively unaddressed opportunity during a period of cost optimization

Opportunity for Margin Improvement



Maturing sector putting pressure on margins; energy costs are relatively unaddressed leaving money on the table

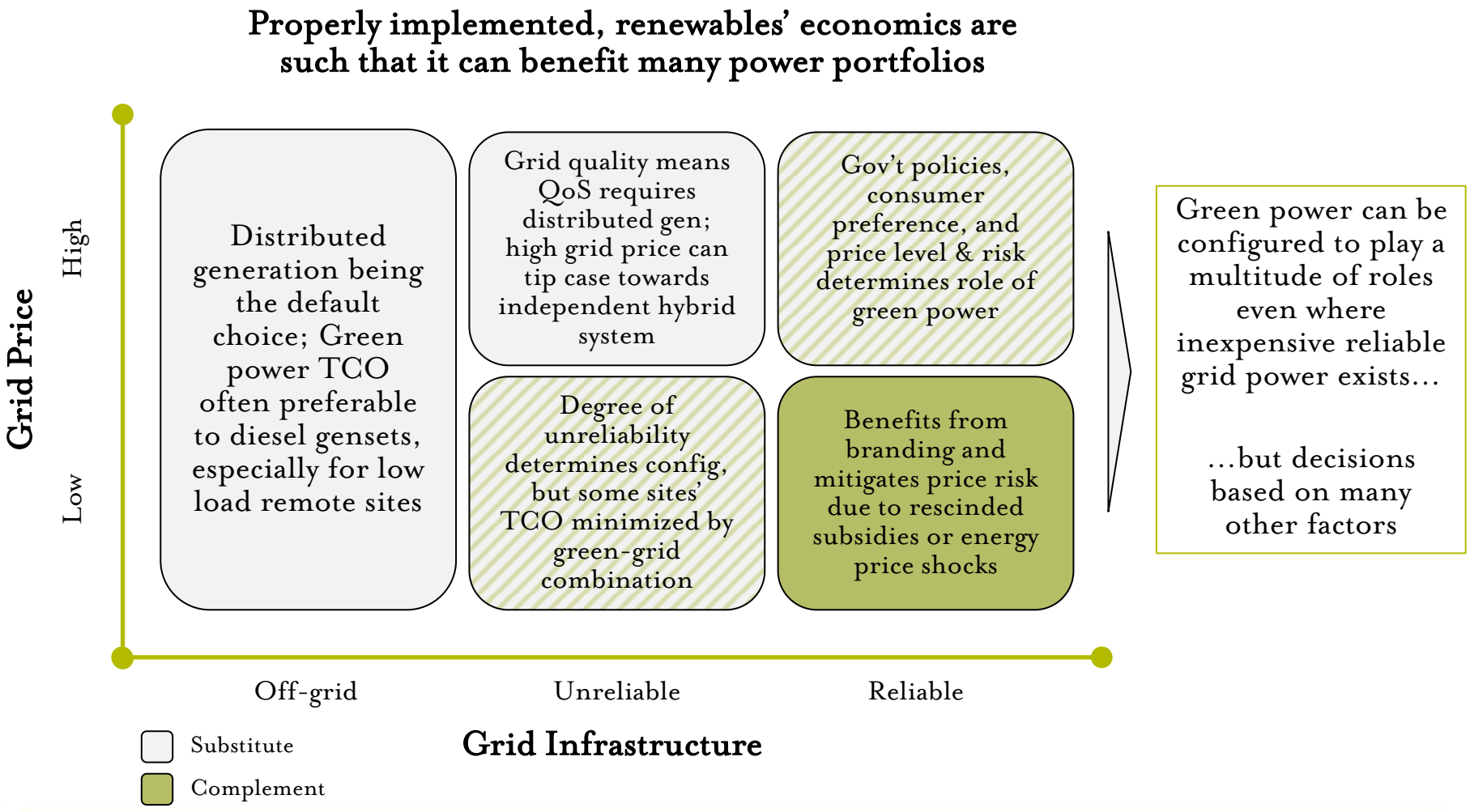
Energy cost evolution could become a major differentiator



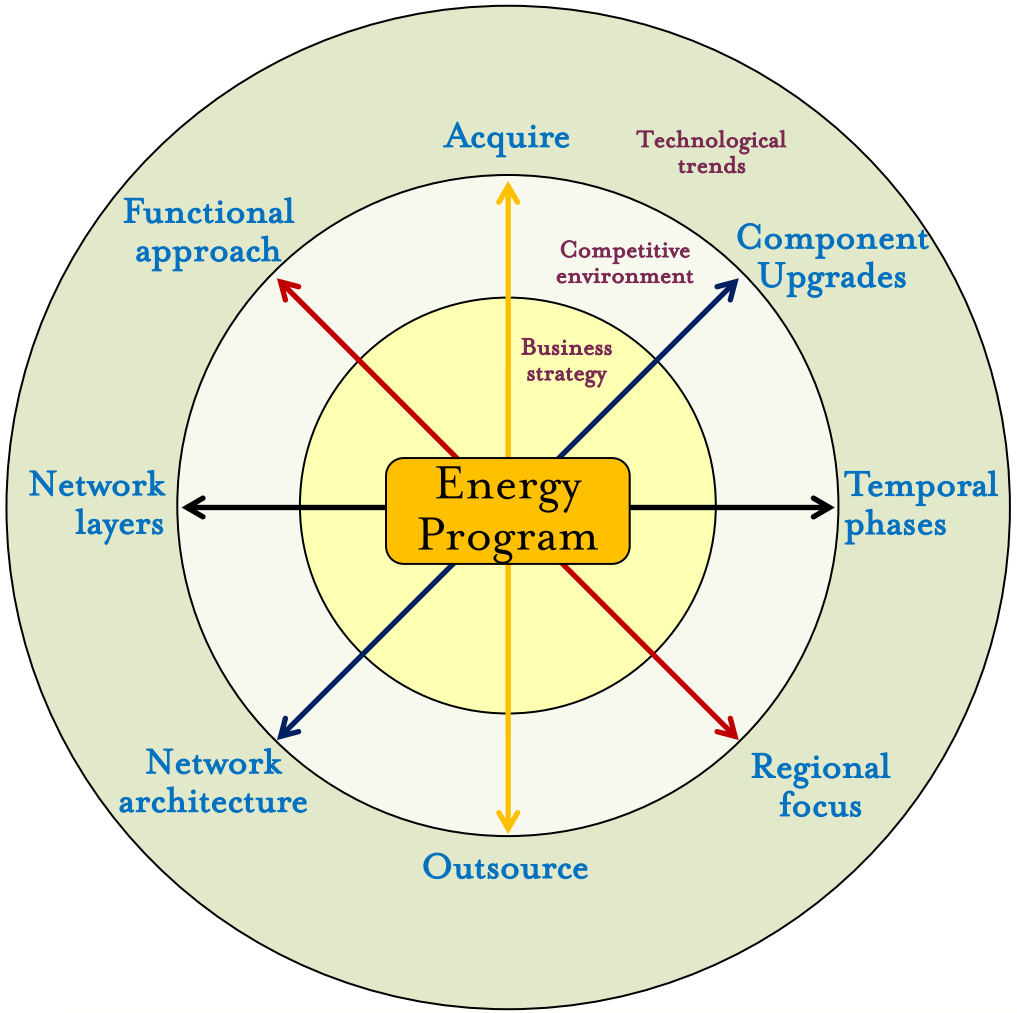
Sample cost evolution for high-usage MNO reveals wide gap of potential outcomes depending on how managed

Sources: HIP Consult analysis; Sample of Mobile Network Operator financial data, and Energy Aware Radio and Network Technologies energy usage forecast

Leveraging Green: Well implemented renewables program can provide both cost and risk advantages, though is not the only approach

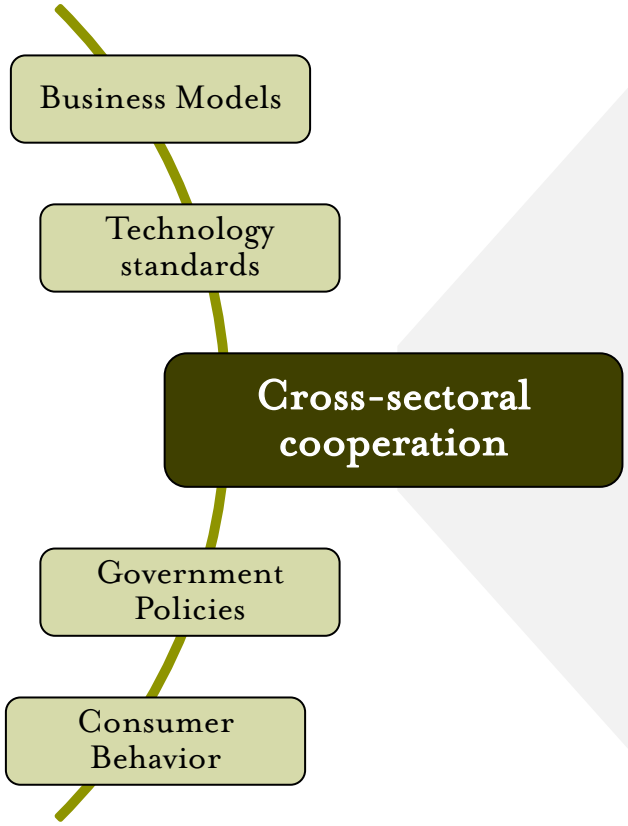


Planning Complexity: Energy is a multi-dimensional problem with strategic, operational and organizational implications



- Energy problem is too complex to address with a purely technical approach
- Site configuration, component upgrades, etc. may all be part of the solution, but more important is how the process is managed
  - Vision: Where do we want to be in 5 years
  - Decision: How to manage the transition
  - Execution: Implement and monitor change
- "Solutions in a box" lack strategic coherence; an energy program cannot just be bolted on
- Vendor customer value propositions are often based on controlled pilots conducted in the organizational vacuum of a laboratory
- Implemented piecemeal, MNOs often find energy investment returns fail to materialize
- Careful consideration also required to ensure that competitive advantage is not outsourced
- Supporting infrastructure (e.g., IT monitoring or procurement processes) and organization (e.g., maintenance and support) can be just as important as technical innovation

Strategic Partnering: Intersection of two dynamic industries requires alignment of interests and requirements



Challenges:

- Limited deployments & data inhibit business planning
- Dispersed pockets of expertise in parallel technologies
- Challenge for vendors to understand MNO needs
- Rapid innovation in both can lead to divergence
- Capacity / utilization dilemma

Enabling Factors:

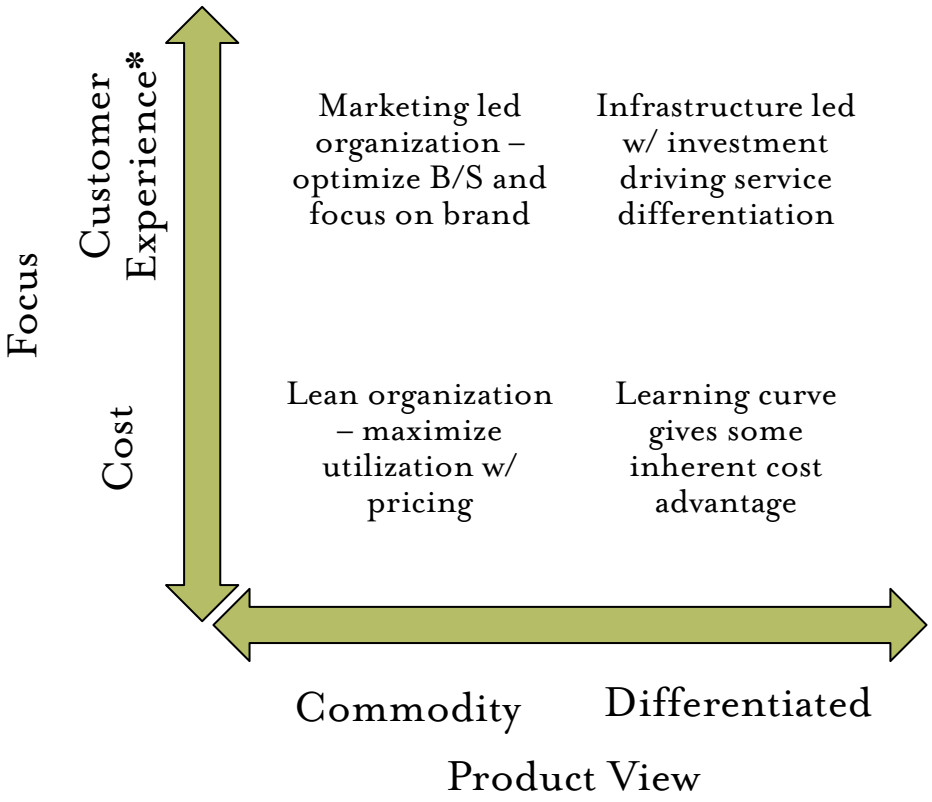
Data aggregation and sharing (GSMA)	Long-Term purchase agreements	Joint innovation centers / pilots
Strategic alliances	Creative financing / JV structures	Integrated supply chain planning

Resulting Benefits:

- Transparency facilitates capital budgeting decisions
- Financial certainty for vendors to scale capacity
- Technology / standards risk mitigation for MNOs
- Turnkey solutions to reduce vendor fatigue
- Greater speed to market to leverage innovation

Commercial Alignment: Energy Strategy needs to support competitive positioning

Business Frameworks Shape Energy Program



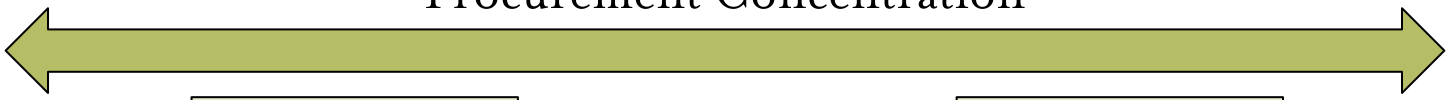
Illustrative Guiding Principles

Outsourcing with premium on SLAs and QoS	Ownership of strategic assets / capabilities
Delayering / infrastructure sharing to target price elasticity	Capital investments in efficiencies

Business determines whether one invests in cost efficiencies or looks to the market

* Customer Experience encompasses a range of factors such as QoS, green offerings, value-added services, applications etc.

Co-ordinated Approach: Requires a balance between top-down mandates and bottom-up testing of initiatives



	Functional / Regional	Centralized
Benefits:	• Bottom up innovation feeds through org • Encourages locally optimized solutions • Leverage relationships with local providers • Better placed for implementation issues	• Leverage economies of scale and cut duplicate costs of "siloed" initiatives • "Pet Projcets" assessed in overall capital budgeting process and prioritized • Engage larger power companies / ESCOs
Risks:	• Duplicate fixed costs across organization • Limited economies of scale / big player interest in fragmented projects • Alignment issues with corporate strategy	• One size fits all approach may limit market testing of new business models / technology • Providers' service levels can vary significantly across regions / expertise • Decision makers may lack local knowledge

Energy solutions can be very location specific so it is important that integrated procurement processes include cross-matrix stakeholders

Alignment with corporate strategy allows demand aggregation on a scale not possible absent a presence in executive level planning

Flexibility in Execution: The energy value chain for MNOs and TowerCos is still developing; emerging business models continuously assessed

Course changes based on performance tracking during implementation

	Tactics	Strategy
Step Change	Component / vendor surveys to find new solutions to focus areas; test new business cases & update RFPs	Review new approaches to energy management; reassess hypothesis and desired end state
Incremental change	Adjust forecasts based on historical data; slight changes to investment plans at the margin	KPIs tracking below targets; refine strategy for specific functions, regions or layers

Management systems and reporting bridge gap with technical teams

- Program management function leads cross-functional activities
- Project plan ensures critical path work streams are prioritized
- New processes developed and training to smooth transition
- RFP design and guidance ensures vendors meet business requirements
- Multi-Level Balanced Scorecard measurement cascades accountability
- Strategies updated in response to new business models or competitors
- Executive-level dashboard reporting makes energy an explicit input

Energy Program Framework: Deliberate approach to assessing strategic implications and prioritizing initiatives based on a holistic view

Phase 1: Analyze and Adopt Strategy

Assess legacy energy cost structure:
- Benchmark major cost drivers
- Identify problem/risk areas

Conduct strategic analysis:
- Network evolution
- External energy trends
- Competitive positioning
- Organizational resources
- Economic / scenario analysis

Identify Desired State:
- Design strategy, set priorities
- Risk assessment

Initial phase assesses energy in the context of business objectives and competitive environment

Identify quick-wins along with long term investment requirements

Phase 2: Develop Energy Program Roadmap

Conduct requirements analysis:
- Organizational resource and capability requirements
- Implementation dependencies
- Build, acquire or outsource

Develop implementation plan:
- Map critical path
- Investment decision process
- KPI targets to sustain beyond a few budget cycles

Design primary processes:
- Cross-functional participation
- Technical / commercial interface
- Business intelligence systems

Integrated approach with realistic targets founded on a solid business case to achieve long-term commitment

Phase 3: Execute, Assess and Calibrate

Divide and conquer:
- Isolate lowest common denominator projects
- Outsource v. Internalize for each

Monitor and optimize:
- Benchmark against targets and industry standards
- Unintended consequences
- Flexibility to change course or incorporate new technologies

Reassess:
- Disruptive technology or new entrant impact on competition
- Emerging business models

Flexible processes prevent vendor or technology lock-in and to find niche applications with above average returns

Key Takeaways

1) Energy challenge and opportunity

- MNOs have rationalized costs across their organizations but energy is relatively unaddressed
- Energy efficiency investments should be ranked by incremental returns; savings are fungible whether through DSM or green power (similar rationale backs carbon trading framework)

2) What can be done about it

- Ensure full TCO consideration of energy costs in business planning decisions
- Implement an Integrated Energy Strategy & Program to ensure organizational alignment and leverage company processes to maximize returns

3) Engaging at a strategic level

- Conduct an organizational/operational audit and competitor analysis to identify strategic assets, core competencies and the desired end-state business model
- Develop an Energy Program Roadmap for timing the "build, acquire, or outsource" phases while beginning monitoring to establish performance measurement baselines