Executive Summary: Demand Management in the Israeli Household Sector

The NZO Project

Introduction and Context

Israel stands at a critical juncture in its energy transition. Rising demand driven by population growth, electrification, and climate change is straining an already vulnerable electricity system. The supply side faces limitations: solar power potential remains underutilized, and reliance on fossil fuels continues to drive emissions. Traditional responses, such as building new power stations and expanding grid infrastructure, are costly, slow, and environmentally damaging. Against this backdrop, demand management emerges as a proven, cost-effective, and sustainable strategy. International experiences in the UK and California demonstrate its feasibility and effectiveness. This report, developed by the NZO team at the Heschel Center for Sustainability, argues that integrating the household sector into demand flexibility programs is a pivotal step for Israel.

Key Challenges and Opportunities

The first major challenge relates to climate and energy transition pressures. Electricity accounts for approximately 43 percent of Israel's greenhouse gas emissions. Although Israel has set a goal of generating 30 percent of its electricity from renewable energy by 2030, the country currently lags far behind global benchmarks. Climate change impacts in the Middle East, including heatwaves, droughts, and reduced precipitation, further intensify electricity demand and complicate supply management.

Another key challenge lies in grid congestion and reliability risks. Peak demand already threatens grid stability, as demonstrated in June 2023 when 260,000 consumers experienced blackouts. Congestion in transmission and distribution networks prevents the full integration of renewable projects. The State Comptroller's 2024 report warns of annual damages of up to NIS 2.4 billion if demand gaps persist.

Alongside these challenges, there is a significant opportunity in demand flexibility. Shifting consumption from peak to off-peak hours can optimize renewable integration, reduce emissions, and save costs. Household participation can multiply the impact. While individual homes consume less electricity than industrial facilities, their collective flexibility potential is considerable.

Demand Management Tools and Approaches

Demand management relies on financial incentives, consumer awareness, and smart technologies. Four main strategies are applied internationally:

- **Shape**: Long-term behavior change, such as time-of-use tariffs.
- **Shift**: Moving demand to periods of renewable surplus, such as encouraging electric vehicle charging at night.
- **Shed**: Immediate reduction of consumption during critical peaks, which is the focus of this report.
- **Shimmy**: Rapid adjustments for frequency balancing.

The report emphasizes Shed strategies for Israel. This approach calls for voluntary household demand reduction during peak hours, supported by direct financial compensation and communication through apps, SMS, or digital platforms.

Two implementation models are highlighted: **Voluntary participation**: Consumers independently adjust their usage, for example by postponing laundry or lowering air conditioning. **Remote control**: Aggregators or suppliers adjust smart appliances such as thermostats or electric vehicle chargers in real time.

International Case Studies

In the United Kingdom, Octopus Energy implemented a household demand response program during the winter of 2022–23. Consumers reduced demand by 10 to 40 percent during peak events. Clear communication and transparent incentives drove high participation, demonstrating the scalability of household-focused demand response.

In California, demand flexibility programs have also shown strong results. The SmartAC initiative, which enabled remote control of thermostats, reduced consumption at scale. Customers were compensated, awareness increased, and system reliability improved. These programs proved critical during extreme heat events.

These experiences confirm that Israeli households can be mobilized effectively when incentives, trust, and smart systems are in place.

Benefits of Household Demand Management

Household demand management carries several clear benefits. It enhances grid stability by reducing the risk of blackouts during summer and winter peaks. It delivers cost savings by lowering operational costs for the grid while also reducing electricity bills for consumers. It has a positive climate impact by enabling greater renewable utilization and lowering greenhouse gas emissions. It improves energy security by reducing reliance on fossil fuel backup plants. Finally, it strengthens social engagement by building a culture of shared responsibility and energy awareness.

Implementation Roadmap for Israel

The roadmap for Israel begins with immediate actions between 2025 and 2026. These include piloting Shed programs that target households with smart meters, launching national awareness campaigns that emphasize consumer empowerment, and developing aggregator market frameworks with appropriate compensation models.

In the medium term, from 2027 to 2030, programs should be scaled nationwide with full integration of smart appliances and electric vehicle charging. This phase will leverage advanced metering infrastructure, expected to be completed by 2028, and will involve building partnerships with private suppliers and municipalities.

In the long term, beyond 2030, demand management should become institutionalized as a core element of Israel's energy policy. The goal will be to

transition from emergency peak solutions to continuous demand flexibility, while aligning with global net-zero commitments and regional climate resilience strategies.

Conclusions and Recommendations

The Israeli electricity sector is on the brink of crisis but also holds unprecedented opportunity. Household demand management, if widely adopted, can prevent costly and polluting investments in new power plants, enable faster renewable integration, build societal resilience against climate extremes, and deliver financial, environmental, and social benefits at scale.

To succeed, Israel must establish clear regulatory frameworks and incentives, ensure transparent and user-friendly communication with consumers, invest in smart infrastructure and aggregator markets, and foster a culture of consumer participation and trust.

Final Note

Israel is not starting from scratch. Proven models from around the world exist. The key question is whether policymakers, utilities, and households will rise to this challenge and work together to seize the opportunity. The proposed approach envisions households not as passive energy consumers but as active stewards of change, shaping a clean, resilient, and sustainable energy future for Israel. This transformation is not only a technical shift but also a collective act of responsibility and hope for generations to come.