

# HCLSoftware

**Reduce** Energy Consumption  
in Mobile Operator  
Networks and Maximize  
Service Quality



# HCL Energy Savings Executive Summary



## Challenge:

Energy costs in mobile networks are high, often consuming 70-85% of energy for a telecom operator.



## Requirement:

Save energy while maintaining current service quality of experience.



## Solution:

Stand-alone HCL IDES that can be deployed at any operator to provide an energy savings platform.



## How it works:

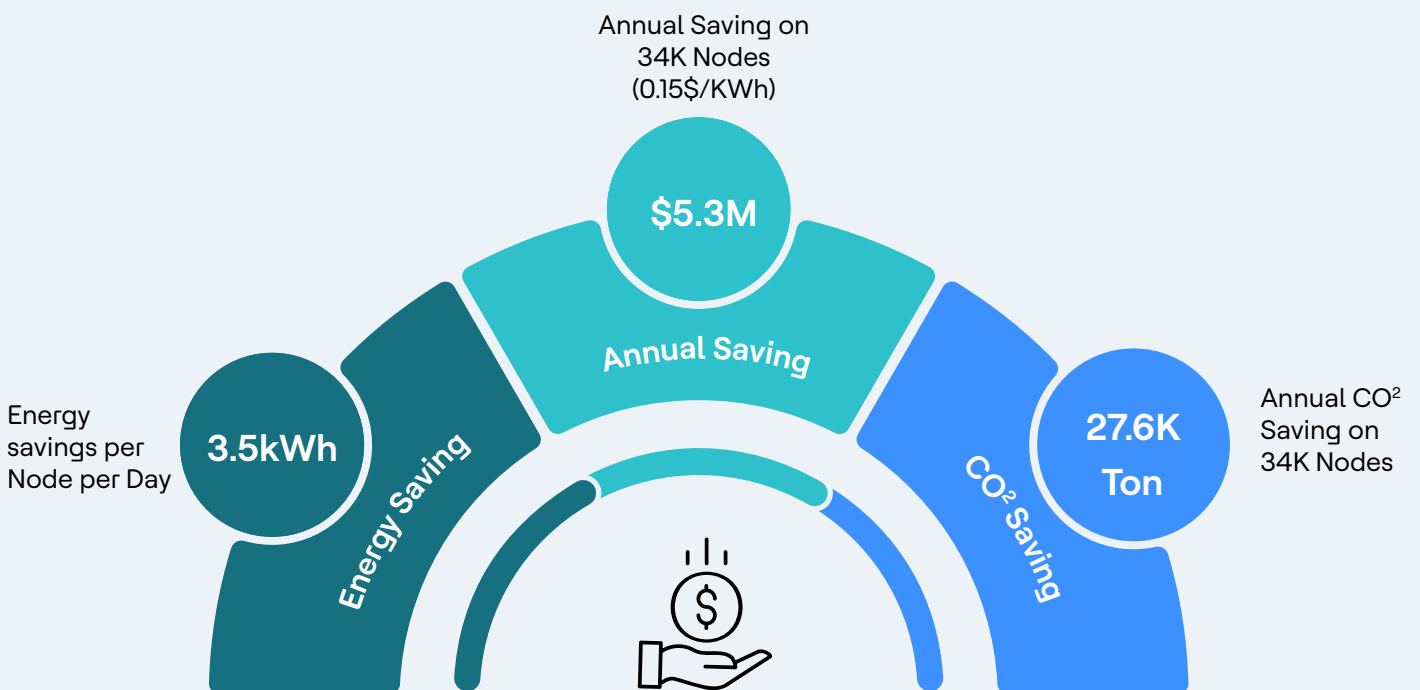
Uses artificial intelligence (AI) for prediction and modeling per node to reduce energy consumption.



## Results:

\$2 million annual savings

- Energy savings per node per day = 3.5kWh (Kilowatthour)\*
- Energy savings on 10 thousand nodes (0.19\$/kWh) = \$2 million dollar of savings
- 276,000 Ton annual CO<sub>2</sub> savings on 34,000 nodes



\* savings based on a typical network return

Mobile network operators (MNOs) face escalating customer demands and fierce competition as global mobile user data consumption surges. This network traffic growth changes traditional patterns. The result is that MNOs have more difficulty planning their network, which negatively affects their customer quality of experience (QoE).

Mobile networks only need a handful of subscribers using bandwidth-hungry services to push nodes into congestion mode. For MNOs to boost their capacity to deliver exceptional subscriber experiences, they need to be able to roll out new nodes that utilize more technology quickly. This adds complexity to network environments that are already challenged with disparate systems.

### Disparate Components of MNO Environments

Heterogeneous network of macro cells and small cells

New RAN architecture of disaggregated RAN, such as vRAN, CRAN, and Open RAN

Current technologies, including GSM, UMTS, LTE, 4G and 5G

As MNOs craft their network strategies for the next five years, they enter a new decision-making cycle. The process is complex because it requires an array of sophisticated technologies to transform the network performance and efficiency. MNOs must evaluate each technology's role and its likely impact on their businesses before placing it on their technology roadmap.

### Telecom Energy Costs Continue to Grow for MNOs

Globally, mobile cell nodes require tremendous amounts of power. Cell nodes in the United States use approximately 21 million megawatt hours (MWh) of

power annually. This is equivalent to the average energy consumed by almost two million households. It is estimated that each 10% reduction in total cell node power results in enough electricity saved to power the equivalent of 195,000 households<sup>1</sup>.

Energy costs for MNOs around the world are already high, increasing by more than 40% in 2022. This adds to the challenges MNOs must manage as they densify their networks to support 4G and 5G roll-outs. According to a recent report published by McKinsey and Company, radio access network (RAN) is estimated to consume 70–85% of energy for telecom operators and MNOs need to reduce their network costs by focusing on electricity use.

### MNOs Must Balance Resource Usage and Quality of Service

As MNOs drive their networks to deliver more bandwidth and services, they must balance resource allocation with service quality—too much results in cost surges, and too little results in a drop in service quality. The mobile RAN should adapt to the actual demand for services. For instance, activate energy-consuming resources, specifically cells, when needed and deactivate excess resources when the service quality can be guaranteed without these.

### HCL Quality of Experience (QoE) and Energy Savings Applications Built on HCL Augmented Network Automation (ANA) Platform

HCL allows MNOs to provide seamless, fast, and reliable 4G and 5G services, using AI to improve network performance in places with high traffic congestion, such as city centers and stadiums. The HCL Energy Savings application also uses AI-based networking automation capabilities to reduce the operating costs of delivering 4G and 5G. By analyzing traffic patterns, the HCL Energy Savings application identifies where network infrastructure can be temporarily powered down during off-peak times, such as at night, without impacting the quality of experience for mobile subscribers.

1. [US Cell Sites- a Sustainability Analysis](#)



## HCL Augmented Network Automation (ANA)

Built on Cisco SON, HCL's ANA is a next-generation SON platform that enables MNOs to simplify network management complexity with a closed-loop network automation environment that supports multi-vendor, multi-technology deployments. The HCL ANA Platform collects and processes vast amounts of data in real-time from all network domains (i.e., radio to transport to core) to automatically predict, configure, and optimize multi-domain networks with self-healing techniques.



The HCL Energy Savings applications are built on HCL's ANA Platform, developed by their Industry Software Division. The HCL ANA Platform is HCL's next-generation network optimization solution. It enables mobile operators to manage their 5G and 4G services globally by automating multi-vendor and multi-technology deployments in cloud or on-premises environments.

### HCL Augmented Network Automation (ANA) Platform in Action

- Customer: Tier 1 telecom provider in North America
- Challenge: to enhance customer experience and network coverage with fast implementation of automated optimization at a low cost
- Solution: HCL Augmented Network Automation (ANA) Platform modules
- ROI:
  - Realized in 8 months
  - \$4 million in annual revenues gained from reduced churn
  - \$2 million annual cost savings from reduced engineering effort

## HCL Intelligent Dynamic Energy Savings (IDES)<sup>2</sup>

HCL IDES is a stand-alone HCL solution that can be deployed within any MNO. It can enable energy savings by using AI and machine learning (ML) algorithms to optimize the energy consumption of mobile without service degradation. HCL IDES works by continuously monitoring and collecting data on network traffic and energy consumption and using this data to predict future traffic demand and energy availability.

Based on these predictions, the HCL IDES algorithm can dynamically adjust network capacity and usage.

For example, HCL IDES can power down cells during periods of low traffic demand or increase capacity during periods of high demand, allowing mobile networks to operate more efficiently and sustainably.

### HCL IDES rAPP.

In HCL's Augmented Network Automation (ANA), an rAPP is a component of the HCL IDES technology that focuses on predicting and optimizing radio access power usage in mobile networks. It is a proven and tested solution that has been shown to provide additional energy savings beyond the standard RAN vendor's energy savings feature.

2. <https://developingtelecoms.com/telecom-technology/>

The HCL IDES rAPP uses ML algorithms to analyze network traffic patterns, predict future traffic demand, and optimize radio access power usage accordingly. This enables MNOs to adjust radio access power in real time based on predicted traffic demand.

HCL IDES results have been impressive, exemplified by a specific cluster for a Tier 1 customer in Western Europe. Here, the application achieved an additional 7% energy savings, with an average daily savings of 3.5kWh per node.

### rApps

The Open RAN (ORAN) architecture introduces new types of automation applications called rApps. An rApp is designed to run on the non-real-time RIC to realize different RAN automation and management use cases, with control loops on a time scale of one second and longer.

### HCL IDES Results

\$2 million annual savings

- Energy savings per node per day = 3.5kWh (savings based on a typical network return)
- Savings on 10 thousand nodes (0.19\$/kWh) = \$2 million dollar of savings
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## HCL IDES Proven Energy Savings Field-Results without Service Degradation<sup>3</sup>

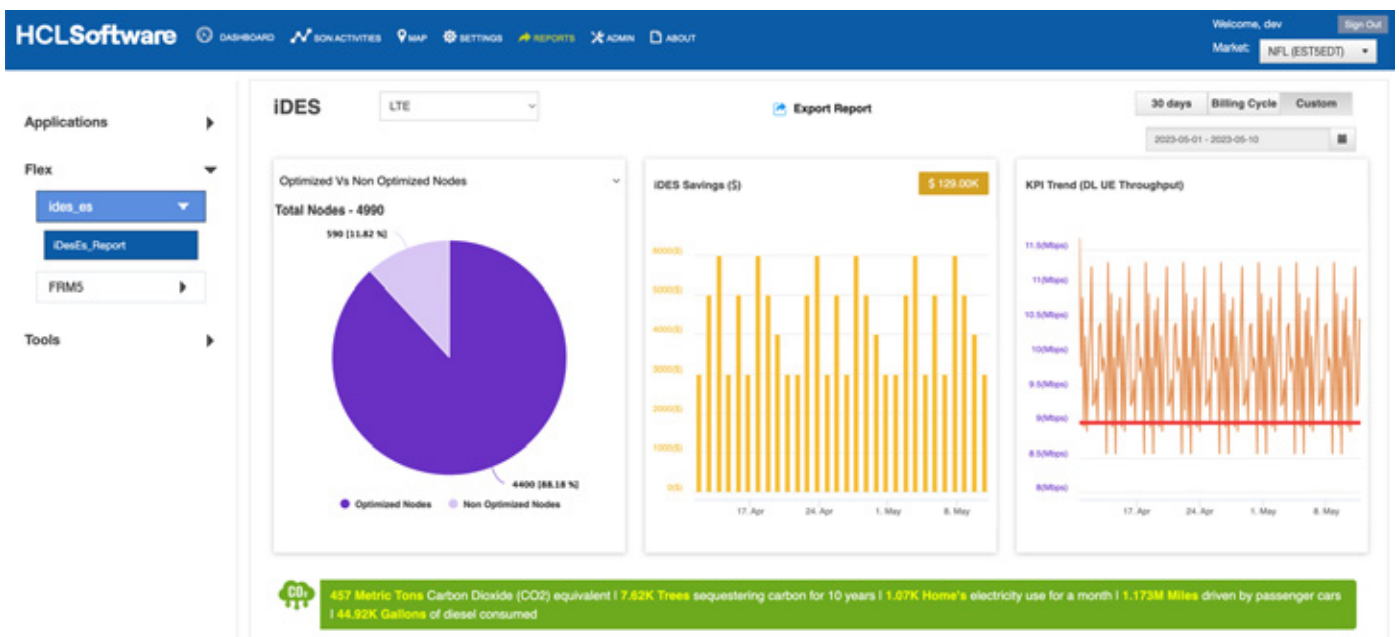
HCL IDES derives energy savings from the HCL Augmented Network Automation (ANA) Platform, where traffic analysis is done per cell based on the algorithm and pattern learning to enable automated adjustments. The delivered energy savings are up to 3.5kWh per hour, per node<sup>5</sup>, over the other vendors' systems that apply power reduction across all cells at the same level. HCL IDES helps MNOs achieve cost savings and sustainability goals by using network intelligence to reduce RAN power consumption in an intelligent, targeted manner without compromising network performance or user experience.

## HCL Software Proven Energy Savings

The HCL Software Energy Savings Dashboard allows MNOs to visualize how much energy they are saving (in \$USD) with the IDES app. The savings presented on this dashboard represent additional savings on top of the existing vendor's energy-saving capabilities. The dashboard allows the MNO to monitor the network performance (through KPIs) while saving energy.

### More Information

Please visit our website for more information on the [HCL Intelligent Energy Savings product](#) or other HCL Telecom Software



The chart provides a comprehensive view of the IDES deployment status, and the information can be downloaded as a PDF. A report view for the different time durations (e.g., per quarter or a custom period) is also available.

3. \$ savings depends on network size (network size equates to number of sites, energy cost per provider), and energy rate.

# HCLSoftware

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## About HCLSoftware

HCLSoftware develops, markets, sells, and supports product families in the areas of Digital Transformation, Data, Analytics & Insights, AI & Automation and Enterprise Security platforms. HCLSoftware is the cloud-native solution factory for enterprise software and powers millions of apps at more than 20,000 organizations, including more than half of the Fortune 1000 and Global 2000 companies. HCLSoftware's mission is to drive ultimate customer success with its IT investments through relentless product innovation.

<https://www.hcl-software.com>