

# Mines can save millions with **NRG1-ECO**<sup>®</sup>

## NRG1-ECO is an innovative mine-wide energy management solution.

It provides system control strategies that dramatically reduce a mine's energy consumption while maximizing productivity, profitability and worker safety. Most mine ventilation systems operate at peak capacity 100% of the time. Yet with the NRG1-ECO ventilation management module, the system's air flow is controlled in order to meet the mine's production activities.

NRG1-ECO analyzes air quality data and the location of mining personnel and vehicles, adjusting the ventilation accordingly in a fail-safe manner. The NRG1-ECO system is configurable to each mine's unique requirements and designed with an open architecture that allows system integration with existing or new equipment.



## System Features

### Environmental Monitoring

Monitors and logs digital or analog sensor information, such as particulate, SO<sub>2</sub>, CO, NO<sub>x</sub>, barometric atmospheric pressure, temperature, humidity and air flow.

### Fail-Safe Design

Provides customizable failsafe responses that put personnel safety first in the event of communication and equipment failures.

### Open Architecture

Integrates with new or existing systems, such as Allen-Bradley, Schneider Electric, Siemens, Cisco, AeroScout, Becker, Varis, Smart Tag, PI, ION.

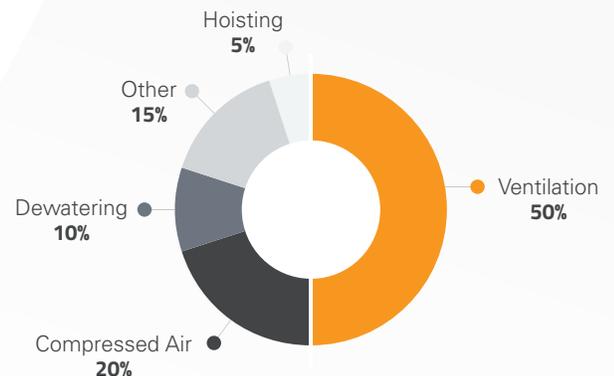
### Blast Gas Clearing Capabilities

Efficient clearing of blast gases allows for a reduction in downtime.

### Quick Location Tools

Instantly locates personnel in case of an emergency or incident.

### Typical Energy Profile in North American Underground Mines



## NRG1-ECO – Software Suite

NRG1-ECO Services communicate to the Intelligent Zone Controller (IZC), which is a state-of-the-art control system powered by the revolutionary AutoGen technology. Historical data is stored to any number of desired sources (database, data historian, etc.).

Integration to existing mine software and systems is provided as a value added service. Web based interfaces clearly display NRG1-ECO data and users with appropriate credentials are able to adjust the control settings as needed.



## Software Features

### WebHMI

Environmental monitoring interface;

Device control and monitoring.

### WebHMI Designer

User friendly drag-and-drop interface for creating displays.

### Configuration UI

User, role and permission management;

Tag configuration and assignment;

Batch configuration and scheduling.

### Tag Verification System (TVS)

Kiosk web product to verify that tags are in good working order.

### 3D Viewer

Real-time monitoring of assets, devices and environment with a 3-dimensional interface.

### LOCATE

Personnel, vehicle and equipment location tool;

Emergency/evacuation management.

### Advanced reporting module with ability to export to various formats

### Historical logging (supports PI)

## System Platform

-  **Operating System**  
Microsoft Windows Server
-  **Database**  
Microsoft SQL Server
-  **Code Engine**  
AutoGen IPnP  
(Industrial Plug and Play)

## Benefits

- ✓ Can reduce a mine's energy consumption by 30-50%
- ✓ Lessens strain on power distribution system
- ✓ Increases productivity and profitability
- ✓ Diminishes greenhouse gas emissions
- ✓ Improves worker safety
- ✓ Integrates with and augments asset and vehicle tagging systems
- ✓ Controls and optimizes ventilation flows
- ✓ Supports other energy intensive systems within mines
- ✓ Monitors and logs air quality data

## Levels of Control

**Manual Real-Time** — allows user manipulation of devices through a web interface.

**Time of Day Scheduling** — automatically adjusts devices at specific times of the day such as the start or end of a shift.

**Event Based** — devices will be stopped, started or adjusted based on an operational or programmed event.

**Environmental** — responds to environmental sensor networks inside the mine to maintain air quality within regulated parameters.

**Tagging (Activity Based)** — integrates with new or existing Real-Time Location Systems (RTLs) to deliver the required air flow based on personnel or vehicle locations in the mine.