



## **E! 3266 WEBAIR** <http://www.ess.co.at/WEBAIR>



develops a modular, fully interactive and web based

### **Real-time Air Quality Assessment and Management Information System**

for national, regional and local, urban and industrial air quality management. The WEBAIR project is based on the AirWare system: AirWare has an open architecture and can be configured for a wide range of applications with numerous fully integrated components such as:



- Emission Inventories and models including optional real-time stack monitoring links;
- Monitoring Data management and analysis including real-time data;
- Simulation and Optimization Models for scenario analysis, impact assessment, and real-time modeling with regular, automatic nowcast and forecast runs with data assimilation from real-time monitoring;
- Public Information System components and reporting on regulatory compliance, extending existing monitoring networks.

### **Implementation**

AirWare is implemented as a client-server system under Linux Open Source operating system, using any standard web browser on any PC as client. The system is developed within EUREKA E! 3266 WEBAIR: <http://www.ess.co.at/WEBAIR>

For an on-line implementation example and demo (Republic of Cyprus) see: <http://www.ess.co.at/AIRWARE/CYPRUS>

AirWare is available as

- A turn-key system for local installation with remote support and maintenance, training, and support for configuration and application building, data integration, etc.
- A fully web-based outsourcing solution (ASP) where clients only need an Internet connected PC with a standard web browser to access any and all functions of the system
- Any combination between local base system and remote computational services (such as weather forecasts, 3D dynamic ozone simulations, impact assessment, optimization etc.)

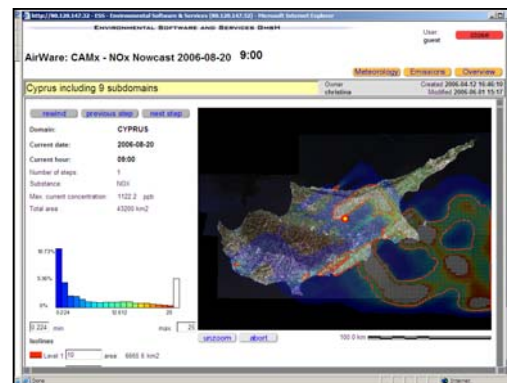
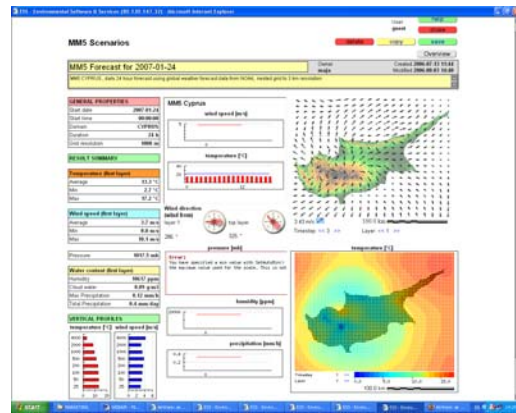
For more information, please visit <http://www.ess.co.at/AIRWARE>  
or contact us by e-Mail: [info@ess.co.at](mailto:info@ess.co.at)



## System components

AirWare combines emission data bases, monitoring data management, and several simulation models for interactive analysis:

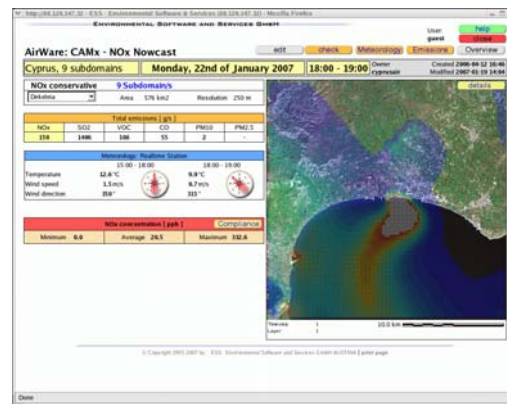
- **MM5**, the fifth generation Penn State/NCAR mesoscale model. a nonhydrostatic, 3D dynamic nested grid meteorological forecasting model
- **CAMx** The **C**omprehensive **A**ir quality **M**odel with **e**xtensions (CAMx) is an Eulerian photochemical dispersion model applicable over many scales ranging from sub-urban to continental.
- **AERMOD** represents the latest of USEPA's regulatory dispersion models, derived from the ISC family of models, based on more current planetary boundary layer (PBL) parameterizations.
- Other models: **PBM**, a photochemical box model, **DWM**, a diagnostic wind model, **TRAFFIC**, a high-resolution near-field model, and **PUFF**, a 3D dynamic Gaussian/Lagrangian multi-puff for transient emission or mobile sources.



## Scheduled functions

AirWare includes any number of scheduled, automatically executed tasks and functions, hourly, daily, or event based

- Daily forecast (MM5 CAMx, AERMOD, PBM)
- Hourly now-cast (CAMx, AERMOD)
- Daily data management (several utilities)



## Forecast and Nowcast runs

- Daily data import from global weather forecast models and daily run of MM5 for the entire domain, down to 1 km resolution as air quality model input;
- CAMx for the entire domain and any nested sub-domains; the model can be run for NOx, SO2, PMx, and ozone
- PBM for all sub-domains (ozone)
- The nowcast runs are executed every hour with real-time meteorology, or the corresponding hourly data from the forecast runs. For the hourly runs of CAMx, the initial conditions are taken from the previous hourly run.





## Data Bases

AirWare maintains a set of coordinated OBJECT data bases that provide input to the simulation models automatically:

- Industrial stacks and boilers
- Small Stacks
- Area sources
- Line Sources
- Traffic Fleet Composition
- Emission Factors and Patterns
- Model Domains
- Model Scenarios
- Monitoring Stations and time series
- Receptor Points and Areas

For each data base, a set of auxiliary tools are available e.g., to estimate emissions from fuel consumption and production activities, estimate wind driven dust entrainment, generate emission patterns over time, analyse monitoring data, check compliance with regulations, report errors or missing data, patch missing data, automatic quality assurance for monitoring data etc.

## Support functions

AirWare includes a range of support function and tools including:

- Embedded GIS, MapCatalog, MapComposition and MapServer
- Knowledge Base editor for the embedded rule-based expert system
- User management and access control
- System log data base for all scheduled processes for remote diagnostics
- Data base maintenance
- Integrated hypertext help- and explain pages and user manuals and tutorials
- System configuration and maintenance to
- A problem-reporting system to support remote support and maintenance functions
- Automatic synchronisation with an optional remote mirror installation

Remote support and maintenance include the possibility of complete operational mirrors, backup and disaster recovery, computational services for demanding (cluster implementation) or mission critical applications, regular updates, continuing user training, application support as well as related studies and consultancy.

