



# THE ENERGY DIAGNOSIS REFERENCE FRAME FOR INDUSTRY




# Environment et Energy Management Agency




## AIR NOISE POLLUTION ENERGY EFFICIENCY DIVISION

INDUSTRIAL AND AGRICULTURAL PROCESS DEPARTMENT



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# ENVIRONMENT AND ENERGY MANAGEMENT AGENCY (ADEME)

## Missions

The **Wastes** and  
The **Soils pollution**

**Atmospheric pollution**  
and **Transports**

**Energy**  
**efficiency**

**Noise**  
**pollution**

**Renewelable**  
**energies**

**Environnemental**  
**management**



Agence de l'Environnement et de la Maîtrise de l'Énergie



# ENERGY EFFICIENCY

## ENERGY EFFICIENCY IN INDUSTRY

THE FIRST **NORMALISATION** ADEME/AFNOR WORK  
IS ISSUED IN 2006.

## THE ENERGY DIAGNOSIS REFERENCE FRAME

THERE IS NOT OTHER INTERNATIONAL NORMATIVE  
REFERENCE





# What legislative context ?...

- ◆ The national Energies Debate in 2003
  - A recommendations document : Energies White Book
  - Law n° 2005-781 adopted 13/07/2005 :  
*Energy policy Orientations Program Law*  
(And its application decrees on energy services)
  - French memorandum for european energy policy with a view to sustainable development (24/01/06)
  
- ◆ Energy Policy Orientations Program law (POPE)
  - ✚ 4 aims :
    - contribute to national energy independence and guarantee security of supply
    - Ensure competitive energy prices
    - Protect human health and the environment, in particular by fighting against climate change
    - Guarantee social and territorial cohesion by ensuring access to energy for all





## What legislative context ?



### The recent european legislation

- The directive on the energy performance of buildings
- The cogeneration directive (2004)
- The framework directive for the eco-design of the products consuming energy (July 2005)
- Directive on energy efficiency in the final uses and to energetic services






## What legislative context ?...



→ Law 13 July 2005  
Energy policy orientations program



◆ Three quantitative objectives:



+ **Energy efficiency**: reduction of 2% per year of the energy intensity until 2015 and 2.5 %/y to 2030

+ **Renewable Energies Development** : satisfy 10 % of energy needs from renewable energy sources, in particular generate 21 % of electricity for the end of 2010 and 50 % of heat renewable production



+ **Reduction of 3 %/y its greenhouse gas emissions** , in perspective of factor 4





## What legislative context ?...

- ◆ Goal of the law = Lower of energy intensity of 2 % per year from 2015 (Today 1 %)



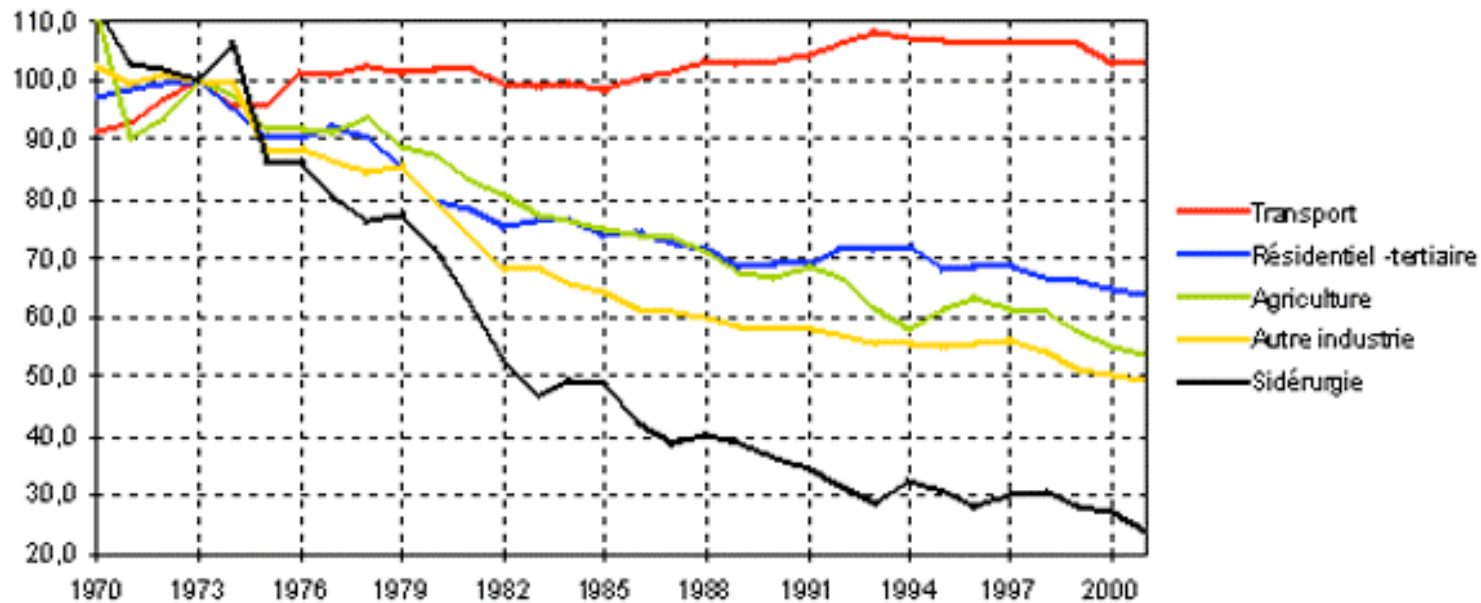


# What Energy context ?...

## ENERGY INTENSITY EVOLUTION IN France BY SECTOR

Intensités énergétiques sectorielles finales (indice base 100 en 1973)

Source: Observatoire de l'Énergie



INDUSTRY → average lower between 1973 and 2001 = 3 %/y



## ADEME/AFNOR Work Context



Under the impulse of French government will, a group of experts from ADEME, AFNOR, the Ministry of industry, concerned professionals and industry representatives, started normative work :

Develop a **reference frame on good practices** for the realization of an **energy diagnosis in Industry**



## ADEME/AFNOR Work Context



2004 : creation of the group of 30 experts

2004-05 : 12 group meetings



-to exchange

-to gather the experiments

-to define a common base among the actors



-to prepare a document


-to formalize a writing




November 2005 = last meeting



## Aim and Base of the work of Reference



The aim of the work was to prepare the **first normative document** on a reference frame concerning the good practices in the field of **energy diagnoses**



The base is principally specifications of the **pre-diagnosis** and the **diagnosis** written by **ADEME** and being used as formal supports with the strategy of decision aid in Industry, such as on the experiment of several years of practice acquired in this fields



It's completed by the experiments of the experts working group





# THE GOOD PRACTICES REFERENCE FRAME

## THE REFERENCE FRAME

- ◆ REPRESENTS A CONSENSUS OBTAINED BY A GROUP OF ESSENTIAL ACTORS IN THE REALISATION OF ONE DIAGNOSIS
- ◆ CONSTITUTES A COLLECTIVE WORK
- ◆ RESULTS FROM THE COMMITTEE OF EXPERTS JOINED BY AFNOR AND CHAINED BY ADEME





## ACTORS INTERESTED BY THE REFERENCE

- ENERGY USING COMPANIES
- COMPANIES OPERATING IN THE AREA OF REGULATORY CONTROL AND/OR ENGINEERING, ADVISING OR CONSULTANCY
- ENERGY OR MAINTENANCE SERVICES OF THE INDUSTRIAL SITES, AND MAINTENANCE COMPANIES
- OPERATORS, ENERGY AND ENVIRONNEMENTAL EFFICIENCY SERVICE COMPANIES
- ENERGY SUPPLIERS
- EQUIPMENT SUPPLIERS
- AUTHORITIES





# ACTORS OF DIAGNOSIS



COMPANIES OPERATING IN THE AREA OF REGULATORY CONTROL AND/OR ENGINEERING, ADVISING OR CONSULTANCY

- ENGINEERING AND DESIGN OFFICES
- CONTROL OFFICES
- AUDIT FIRMS
- INDUSTRIAL TECHNICAL CENTERS
- INDEPENDANT EXPERTS
- .....



## INTEREST OF THE REFERENCE FRAME



### For the **industrialist**

- ◆ a description of a consensual method to which he can refer
- ◆ a base facilitating dialogue, negotiation and exchanges with the diagnostician
- ◆ A time saving tool
- ◆ A way to be aware of what is awaited from him and from the diagnosis
- ◆ Examples of outputs (list of equipments, balances, unfolding of a monitoring campaign...)









## INTEREST OF THE REFERENCE FRAME

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### For the **diagnostician** :

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- 
- 
- 
- Propose a validated method facilitating the dialogue
  - Formalize the participation of the industrialist for a service of quality
  - Reassure and put in confidence the customer
  - get better quality answer to a call for tender
  - develop its know-how, its trade by describing it
  - Obtain an external recognition



# THE ENERGY DIAGNOSIS REFERENCE FRAME



## *THE REFERENCE FRAME :*

*DESCRIBES A METHOD FOR THE REALISATION OF AN ENERGY DIAGNOSIS*

*DEFINES THE CONDITIONS OF QUALITY SERVICE AND THE IMPORTANT PRINCIPLES*

*IS A NORMATIVE DOCUMENT OF AFNOR collection*



# THE ENERGY DIAGNOSIS REFERENCE FRAME : IMPORTANT PRINCIPLES

- ◆ *Be attentive to the industrial needs, constraints and expectations*
- ◆ *Create a communicative relationship*
- ◆ *Establish a clear and transparent project offer*
- ◆ *Be independant, objective and transparent :*
  - *Provide all the objective informations on legal status and financial links with energy or equipment suppliers, or services*
  - *Not intervene in enterprises for which he is the service provider for the area concerned*
  - *Not include any sales offer for goods or services which are related to the recommandations made during the work undertaken*





# WHAT IS AN ENERGY DIAGNOSIS ?



*The energy diagnosis* consists in :

- ◆ elaborating an assessment of the total energy situation
- ◆ Quantifying the energy saving potentials
- ◆ Defining the necessary actions to make these savings



# AUDIT / DIAGNOSIS



## What is the difference between audit and diagnosis ?

Audit is a verification, an estimation, a judgment on a situation

Diagnosis completes this first phase by the study of the optimisation of the situation, and by the propositions of solutions





# REFERENCE FRAME : DIAGNOSIS in 3 PHASES

## THE REFERENCE DOCUMENT :

- + Defines 3 diagnosis phases, in which are identified the objective of each one, its unfolding, the methodology, stages and elements awaited
- + Expresses recommendations concerning the reciprocal engagements between the industrialist and the diagnostician essential to realize a service of quality





## REFERENCE FRAME : 3 PHASES

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For each phase, description of the :

1. Unfolding
2. Méthodology to reach the goals
3. Elements of communication = reports, meetings, results...





## REFERENCE FRAME : 3 PHASES

3 phases :

- Phase 1 = Preliminary study
- Phase 2 = Detailed analysis and measurement campaigns
- Phase 3 = Searching for improvements solutions





## REFERENCE FRAME : PHASE 1

### Goals of the phase 1

- To collect the informations
- To establish the preliminary assessment of the energy situation
- To identify energy savings potentials





## REFERENCE FRAME : PHASE 1

### PHASE 1 : Unfolding

- Preparation with the industrialist (communication of the informations)
- Informations gathering on the site (visit, meetings, interviews..)
- Analysis of data and drafting of the preliminary analysis report
- Delivery of the preliminary analysis





## REFERENCE FRAME : PHASE 1

### PHASE 1 : first report

- The first analysis of the energy situation
- The identification and justification of saving sources
- A description of basic actions to be implemented
- A description of the detailed analysis to be continued (phase 2)
- The suggestion of a monitoring plan for energy consumption and savings





## REFERENCE FRAME : PHASE 2

### Goals of the phase 2 :

- To extend the analysis of the main savings identified in the first phase and chosen with the industrialist
- To establish the real energy needs of the studied process(es)
- To include measurement campaigns
- To consolidate the site's global energy situation





## REFERENCE FRAME : PHASE 2

Phase 2 : detailed Analysis includes =

- To work on the basis of the energy needs, issued of the results of measurement campaign(s)
- To compare with ratios, performances...
- To describe energy saving sources
- To research the malfunctions and their causes (management, maintenance, size of the equipments, technological choices...)





## The energy diagnosis : performance comparison

- *Example : The comparison of energy performances of different industrial laundry sites*



*Diagnoses Results of Industrial Technical Center CTTN*



## REFERENCE FRAME : PHASE 3

### The goals of phase 3

- To specify the actions to make energy savings
- To identify and describe the solutions
- To provide an estimate of the implementation cost and the pay back period





## REFERENCE FRAME : PHASE 3



The solutions are classified in 3 parts

1. *Goods practices behavioural associated with awareness raising and training, knowledge of the facilities and the monitoring of operations*



## REFERENCE FRAME : PHASE 3

The solutions are classified in 3 parts

2. *Goods practices related to the facilities operating processes, including for example : maintenance and operating optimisation, replacement or installation of low-cost materials...*
3. *Mesures requiring high cost investments as modification of the process, replacement of machines...*





## REFERENCE FRAME : PHASE 3

### Phase 3 : final report

- The file for each solution and for combined actions
- The main comparison criteria between the solutions
- A preferred plan for the implementation of actions, undertaking of feasibility study(ies)...
- The main results : energy situation, proposition of a energy management system....





## REFERENCE FRAME : the recommendations



From the diagnostician -> the industrialist

TRANSPARENCY

OBJECTIVITY

CONFIDENTIALITY

COMPLIANCE WITH SITE RULES

From the industrialist-> the diagnostician

TO PROVIDE ACCESS TO THE SECTIONS OF THE  
SITE AND TO THE DOCUMENTS

TO PROVIDE THE MATERIALS AND THE  
EQUIPMENTS NECESSARY FOR THE MISSION  
INFORMATION OF SAFETY RULES



# ENERGY EFFICIENCY, the sites Internet



<http://www.industrie.gouv.fr/energie>



<http://www.ademe.fr>

<http://www.atee.fr>



<http://www.energie-plus.com>

<http://eippcb.jrc.es> (bureau européen de la directive IPPC)





# ENERGY DIAGNOSIS REFERENCE : Bibliography

Principally, ADEME publications :

Charte des intervenants et Cahiers des charges  
ADEME (supports of decision aid in Industry)

Guides ADEME Diagnostic Froid, Ventilation

Guide ADEME/ATEE Air comprimé

Collection ADEME/AICVF Bâtiment à hautes performances  
énergétiques - Industrie

Guide de l'expert : partie 1 de l'examen approfondi et  
visite de contrôle (Arrêté interministériel du 5/07/1977)





## REFERENCE FRAME : THE NEWS

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April 2006

Publication of **ENERGY DIAGNOSIS REFERENCE  
FRAME IN INDUSTRY**



Document Afnor **BP X30-120**

English translating



Training of consulting and engineering companies

Thought about qualification





# ENERGY EFFICIENCY NORMALISATION

## *EUROPEAN WORKS*

- o European normative group CEN/CENELEC BT JWG « Energy Management » (2002-2005) defined a normative strategy on Energy efficiency
- o Creation in 2006 of a sectoral european forum CEN « Energy Management »

**Proposition project of the Energy diagnosis reference frame as a european reference**





## The ADEME's ENERGY DIAGNOSIS SUPPORT

- ◆ Aids dedicated to decision makers
- ◆ Expert services provided by independent consulting and engineering companies
- ◆ Program in place since 2000
- ◆ 3 forms of studies are helped :
  - PRE-DIAGNOSIS, Global or Specialised
  - DIAGNOSIS, FEASIBILITY STUDY
- ◆ ADEME guidelines with formal documents
- ◆ 500 to 600 diagnoses financed/year, since 2000



## The ADEME's ENERGY DIAGNOSIS SUPPORT

- ◆ More 4 000 studies supported by ADEME in Industry over the 2000 - 2006 period
- ◆ 80 % of the diagnoses are followed by immediate or short-term actions
- ◆ 50 % of the recommendations of investments have a pay-back period < 1 year
- ◆ 50 % of the diagnoses generate behavioural changes
- ◆ 90 % of the companies are satisfied with the diagnosis