SOUTH EAST EUROPE
Jointly for our common future

TRACE

Programme co-funded by the EUROPEAN UNION

TRANSNATIONAL THEMATIC WORKSHOP
on ICT solutions to improve the energy performance of buildings

Zagreb, 15th May 2014

ICT SOLUTIONS TO IMPROVE THE ENERGY PERFORMANCE OF BUILDINGS IN ITALY

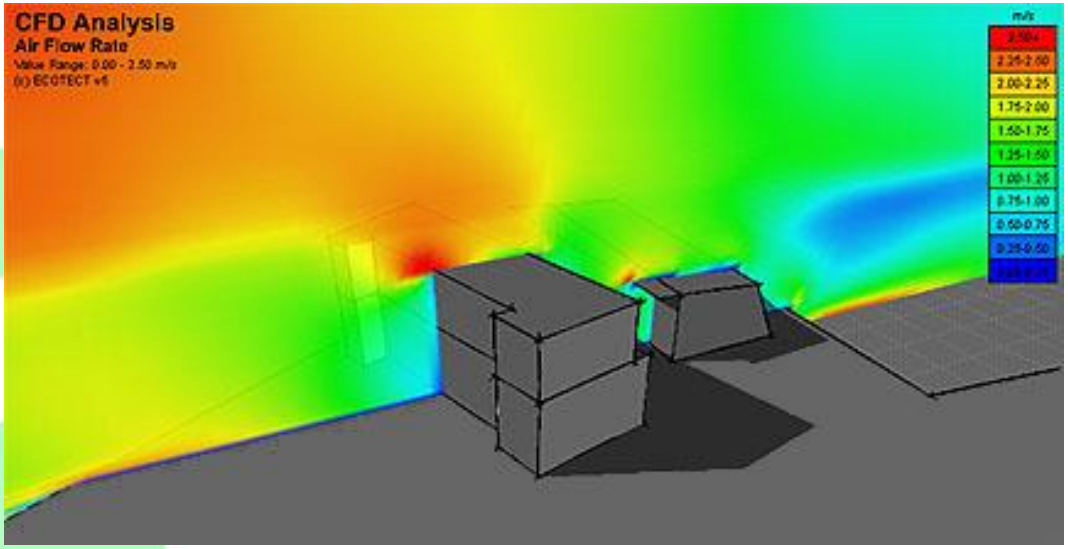
provincia di mantova

Eng.Ph. D. Pierluigi Fecondo, Ph. D.
Province of Mantova

BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

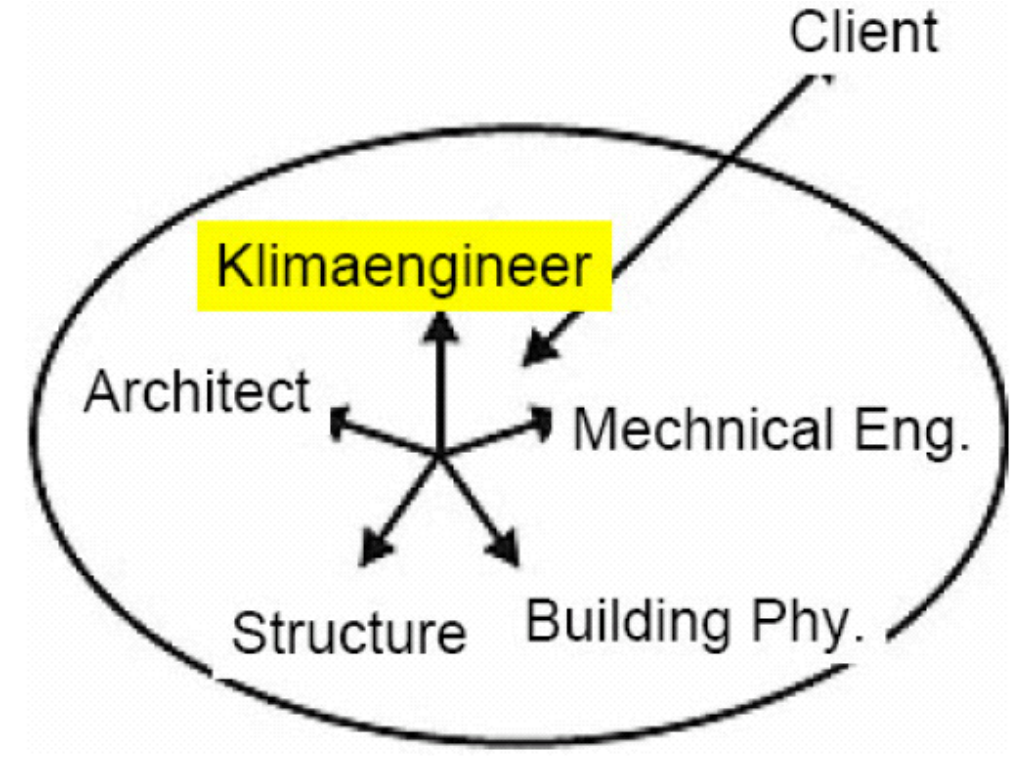
Building simulation is an ICT applied approach for assisting designing through computer-modelling based design and evaluation.

Building software tools can be used for evaluating energy efficiency, renewable energy, and sustainability in buildings.



BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

ICT AND BUILDING SIMULATION TOOLS ARE CHANGING BUILDING CONSTRUCTION FRAMEWORK AND DESIGN PROCESS APPROACH



BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

NEW RELATIONSHIPS when systems are integrated and applied in innovative schemes and buildings

PROCESS CONTROL TOOLS needed to effctively use and monitoring new technologies

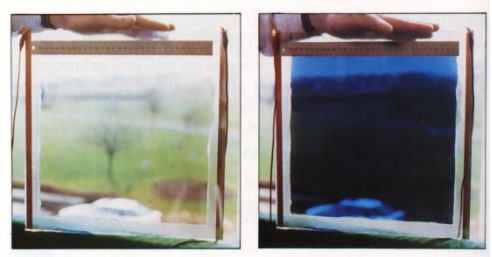
INNOVATION to support design and decisions.

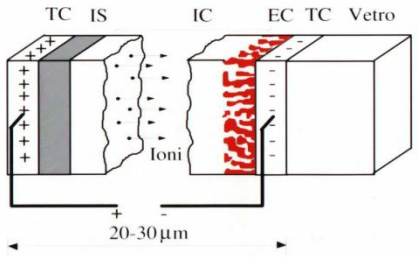
DAYLIGHTING/ARTIFICIAL LIGHTING

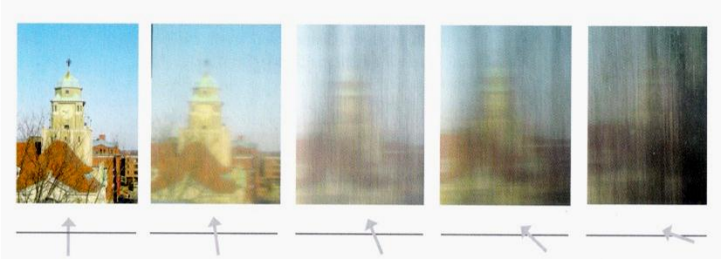
NATURAL AND MECHANICAL VENTILATION

ENERGY SYSTEMS/ENERGY PERFORMANCE

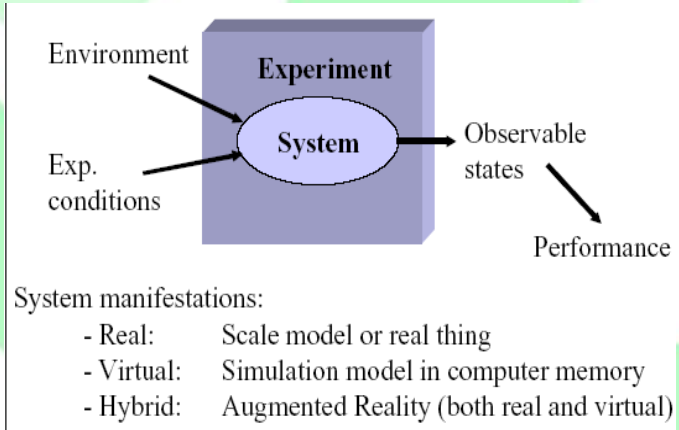
MONITORING AND MANAGEMENT (BACS/BMS)

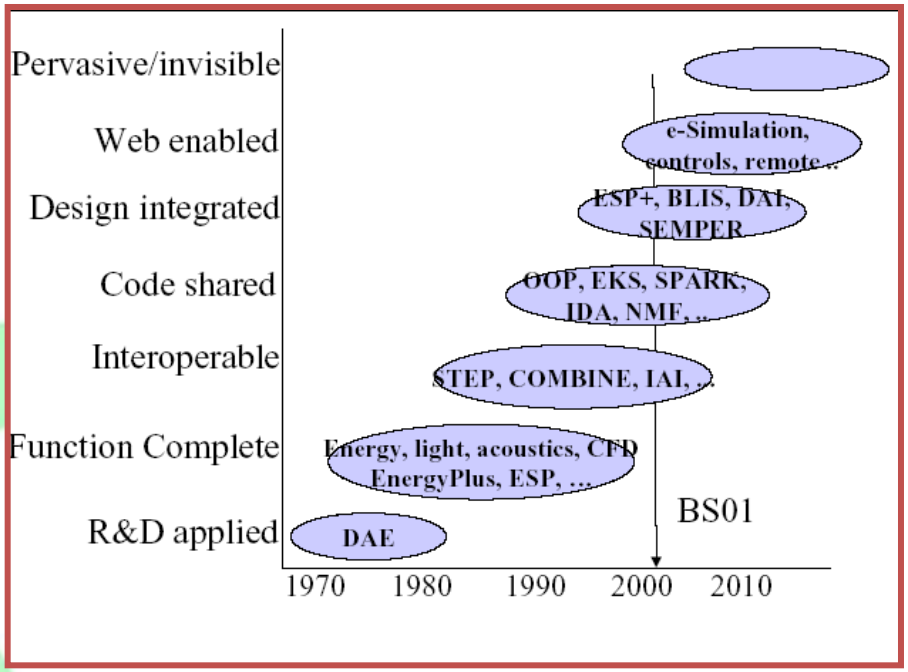






BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW





BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

BST WHOLE BUILDING

Aim to integrate all the calculation procedures for an averall energy perofmance evaluation of building

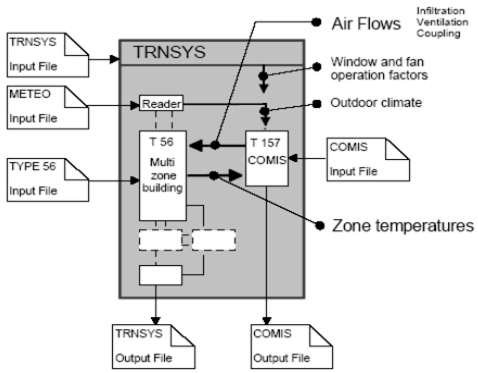
- ❑ ENERGY PLUS
- ❑ ESP – r
- ❑ TRNSYS
- ❑ ECOTECT
- ❑ DOE
- ❑ RETSCREEN

BST SPECIFIC PURPOSES

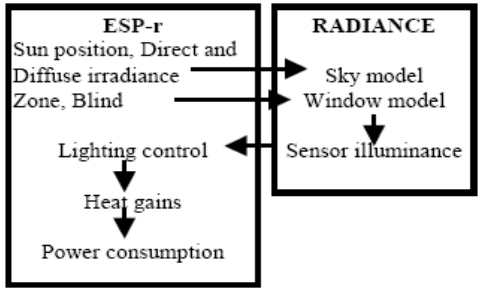
Use procedures in order to provide results for specific purposes, such as lighitng, ventilation, or renewables. They are often used as third-arty applications

- ❑ PASSPORT
- ❑ DIALUX
- ❑ RADIANCE
- ❑ COMIS
- ❑ FLUENT

INTEROPERABILITY



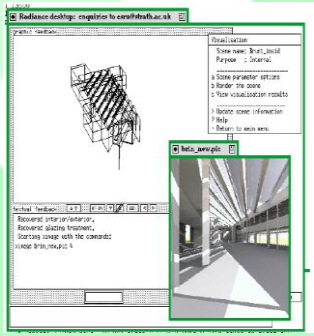
COMIS - TRNSYS

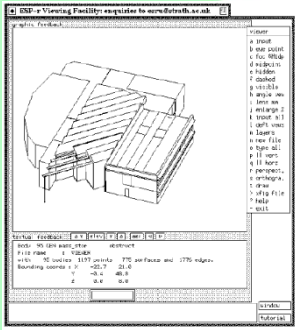


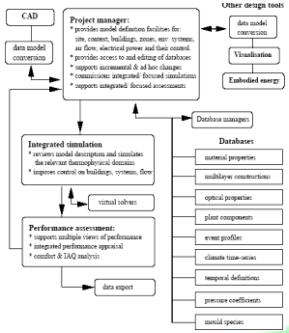
RADIANCE – ESP - r

BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

BST WHOLE BUILDING







ESP - r

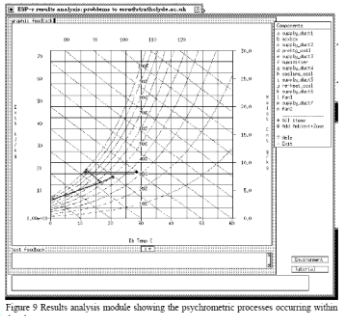


Figure 9 Results analysis module showing the psychrometric processes occurring within the plant.

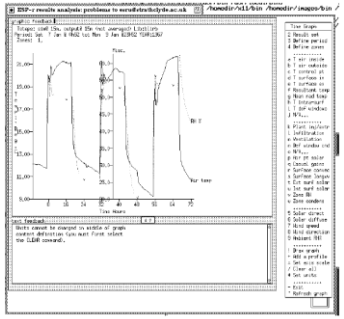
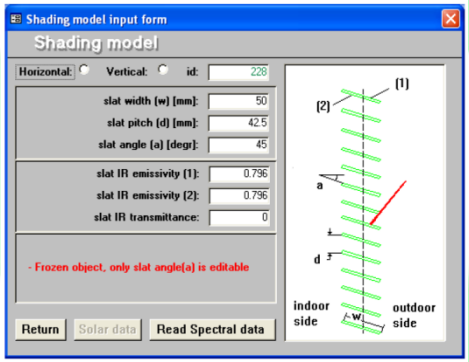
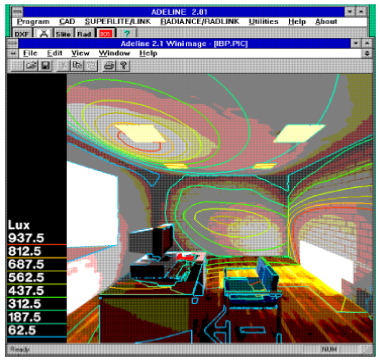


Figure 8 Results analysis module showing the zone conditions

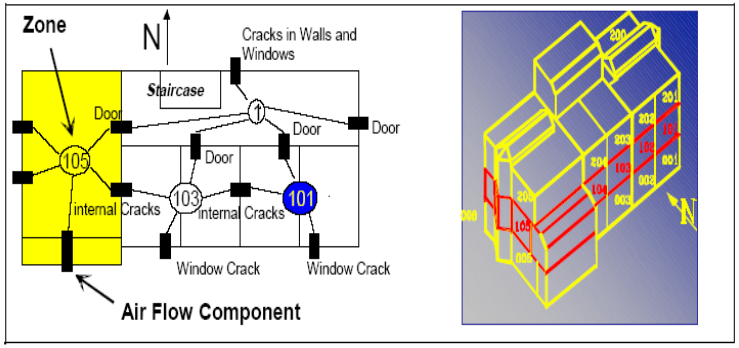
BST SPECIFIC PURPOSES



WIS (Windows Information System)

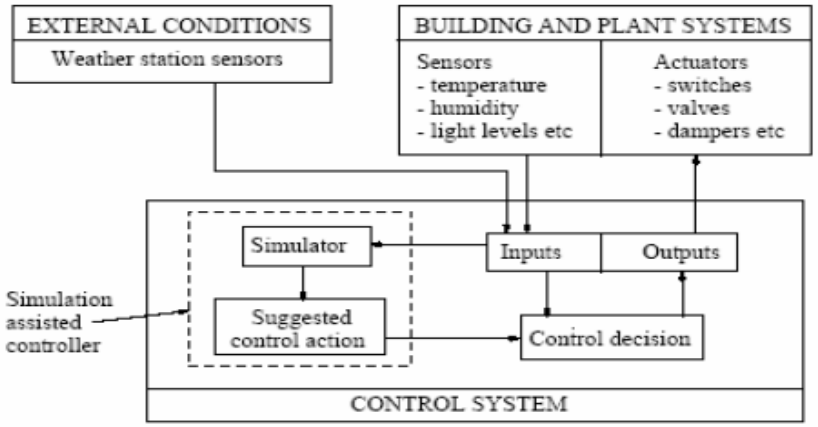


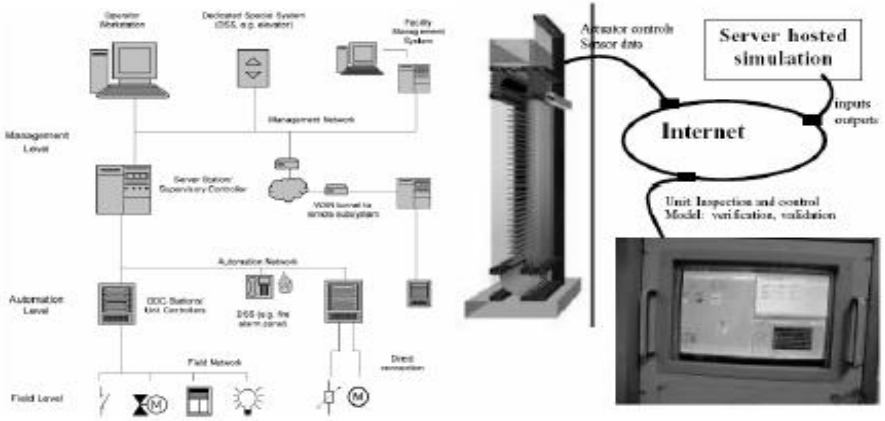
ADELINE

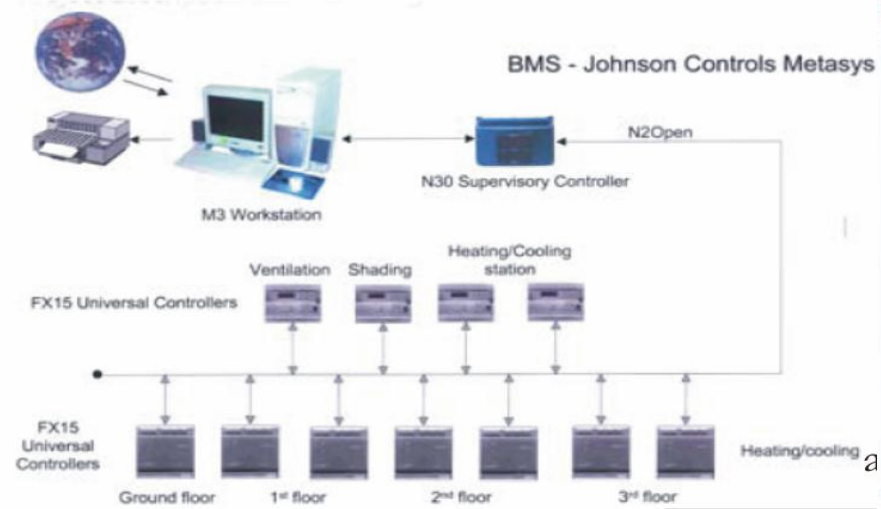


COMIS

BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

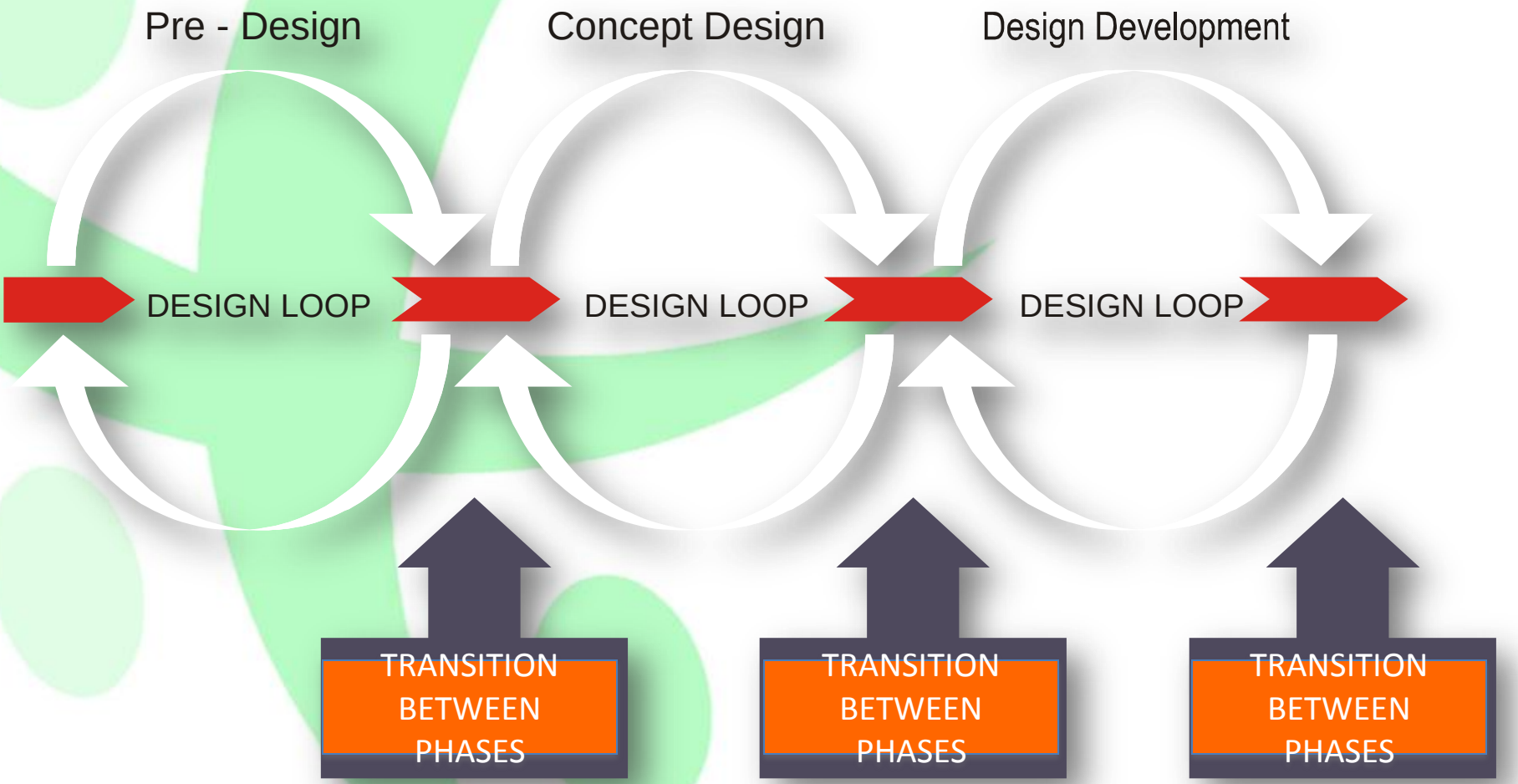






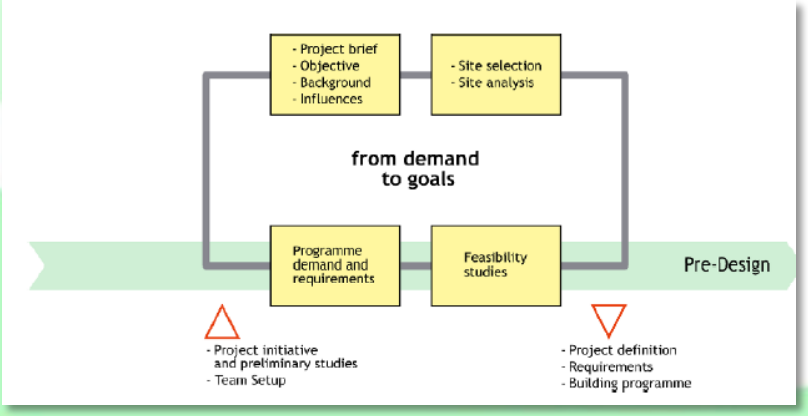
BACS (Building Automation Control Systems)

BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

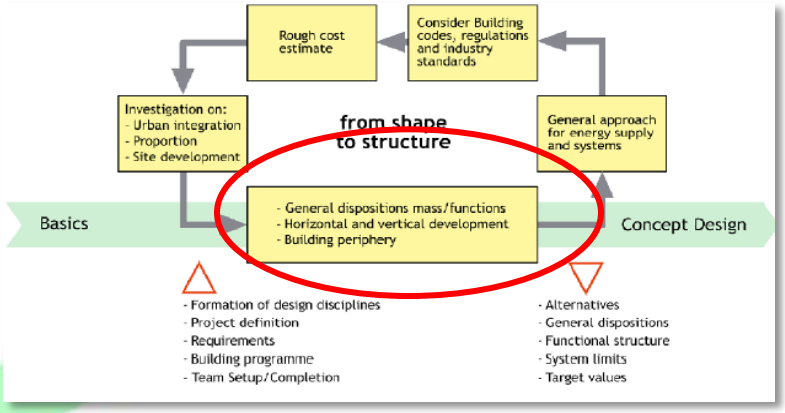


BUILDING SIMULATION AS ICT APPLIED TECHNOLOGY TO BUILDING ENERGY EFFICIENCY: OVERVIEW

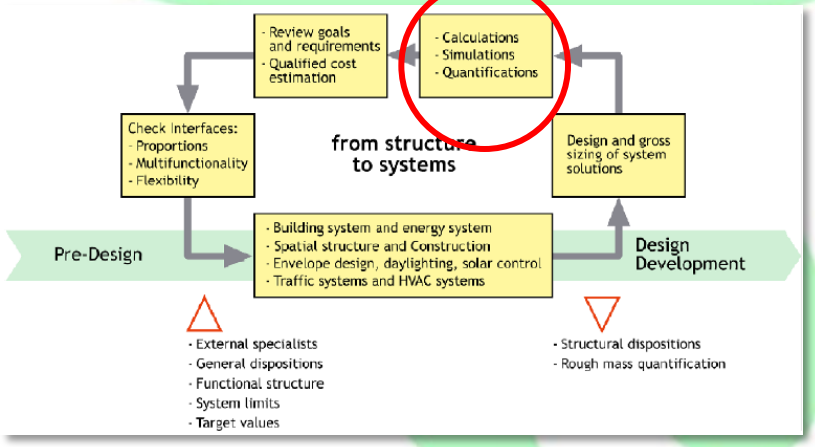
BASICS



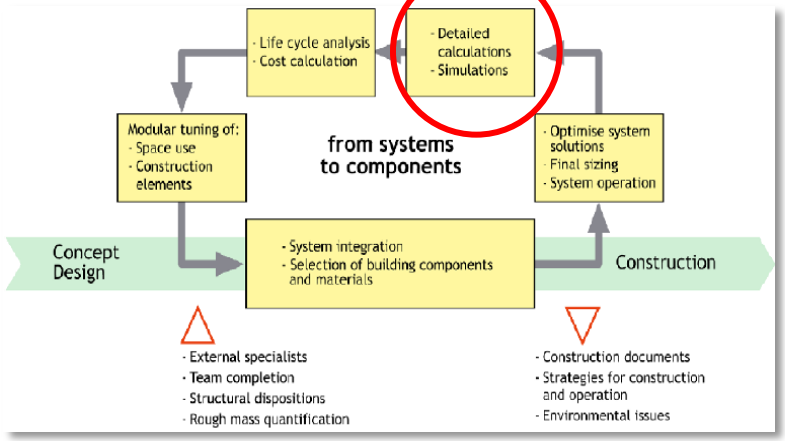
PRE - DESIGN



CONCEPT - DESIGN



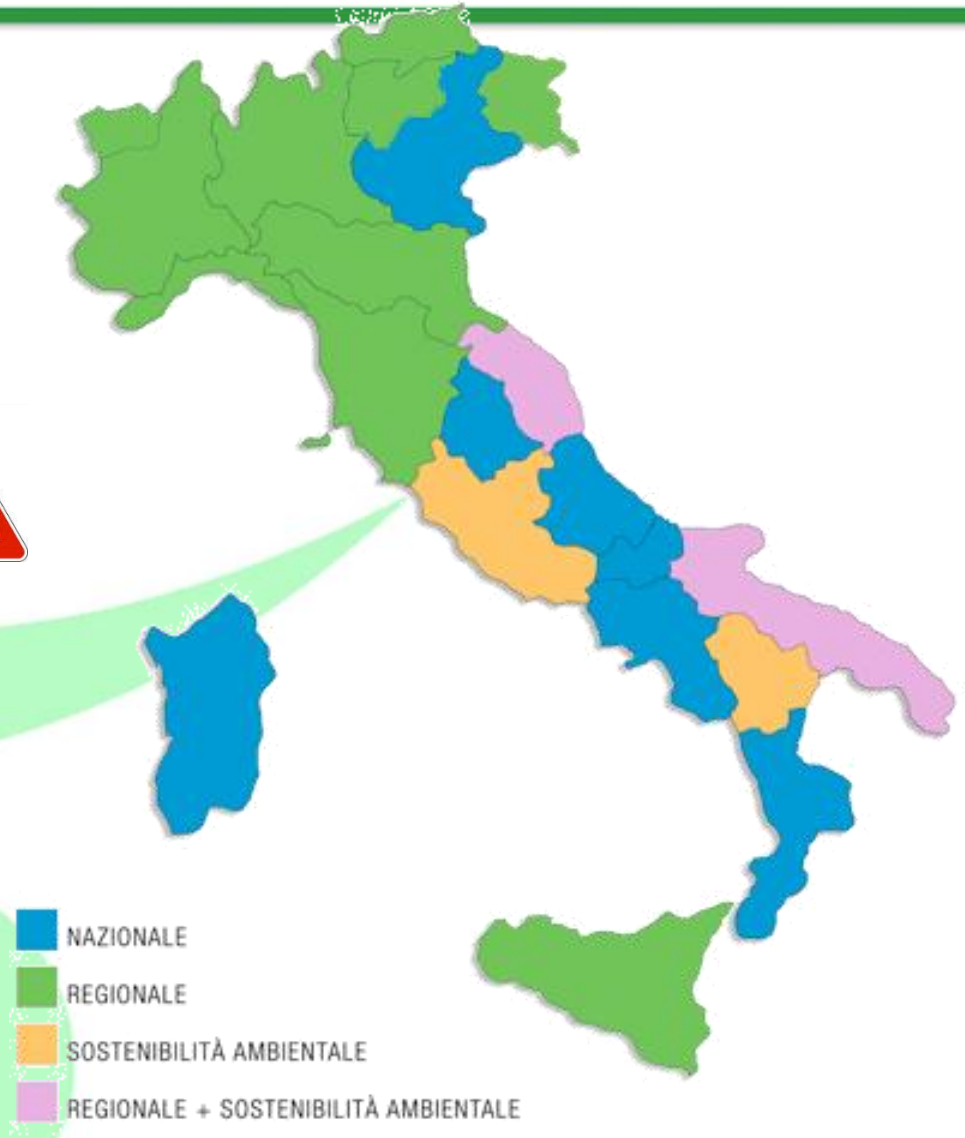
DESIGN DEVELOPMENT



Situation of Energy Performance and environmental sustainability certification protocols at National and Regional level in Italy

Different Regions have:

- Different tools/methods for Building Energy Performance Calculation
- Different ways to collect, monitoring and verify certificates



Direttiva 2002/91/EC sul rendimento energetico nell'edilizia

- Adozione di una metodologia di calcolo della prestazione energetica
- Definizione di requisiti energetici
- Certificazione energetica
- Ispezione degli impianti

Mandato al CEN

Normativa tecnica europea

EN ISO 13790

Recepimento di norme CEN

Normativa tecnica nazionale

(UNI, DIN, AFNOR, BSi…)

UNI TS 11300

Adozione di norme tecniche nazionali

Legislazione nazionale

D.lgs 115/08

Recepimento della direttiva

D.lgs 192/05
311/06

BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION

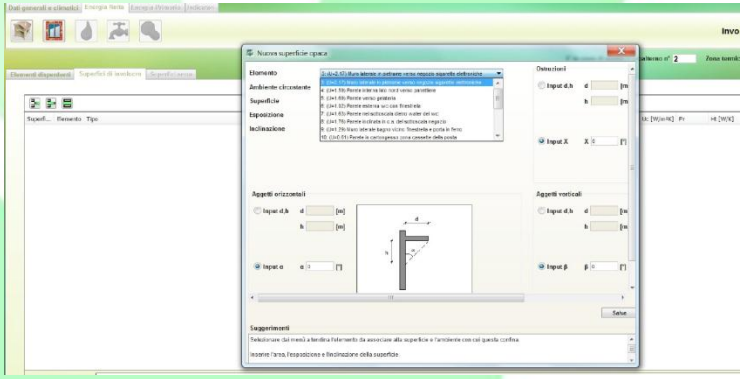
CENED+

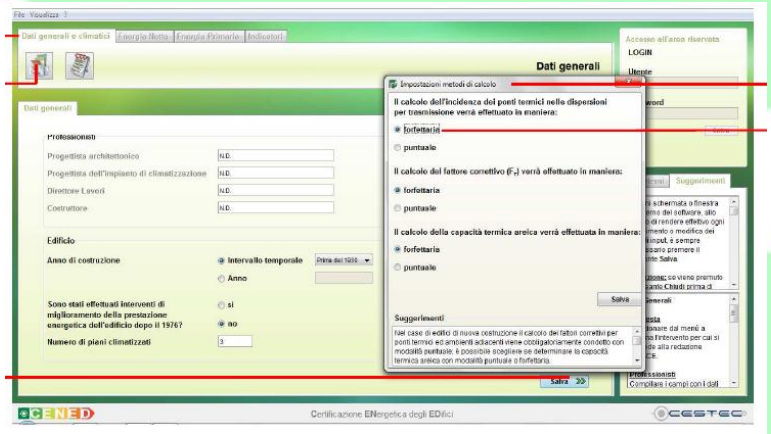
The CENED software (http://www.cened.it/software) is an ICT operating scheme that facilitates the calculations required for energy certification.

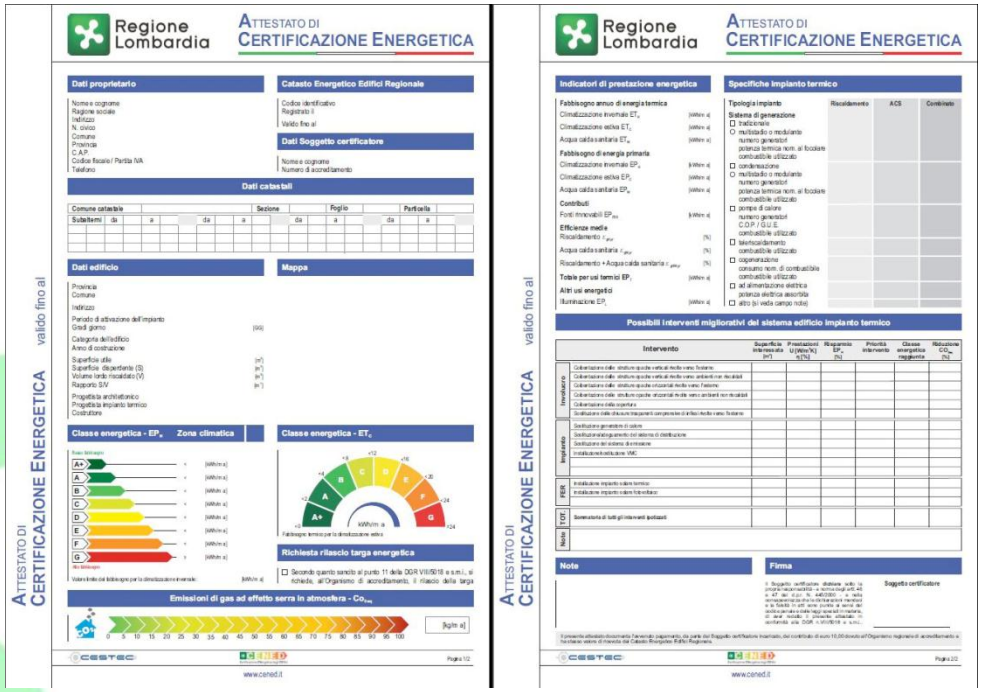
More particular, the data collected from the buildings are entered in the software and the program calculates performance indicators that consider the use of energy for space heating, ventilation, domestic hot water and air conditioning.

TO BE USED ONLY IN REGIONE LOMBARDIA

BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION







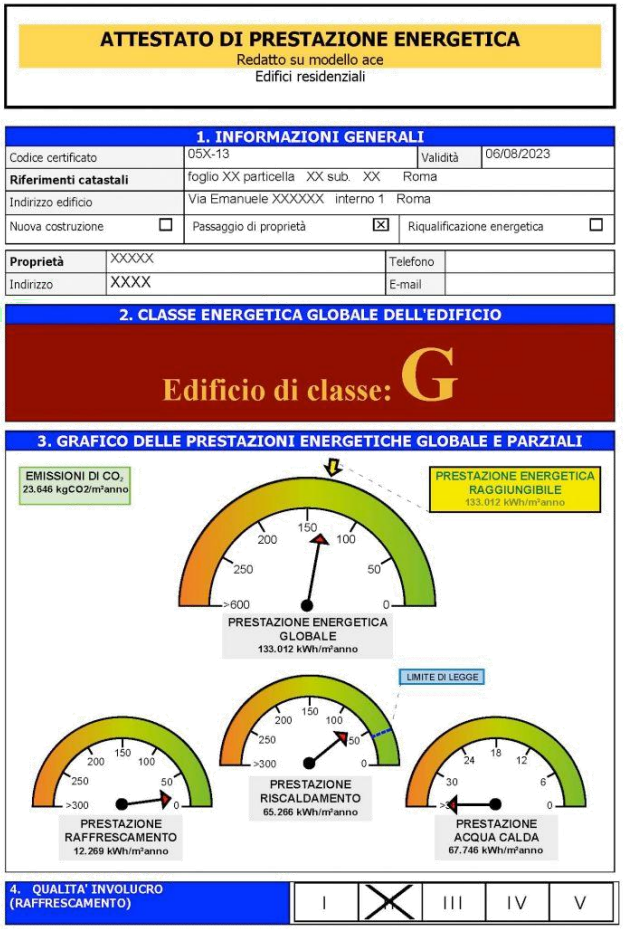
BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION

DOCET

The DOCET software (http://www.docet.itc.cnr.it/) is a simulation tool for energy performance certification of existing buildings. It uses **simplified calculation methods** of UNI TS 11300 Technical Specifications.

TO BE USED AT NATIONAL LEVEL ONLY FOR RESIDENTIAL BUILDINGS WITH FLOOR NET AREA < 3,000 sqm

BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION



ATTESTATO DI PRESTAZIONE ENERGETICA
Redatto su modello ace
Edifici residenziali

1. INFORMAZIONI GENERALI			
Codice certificato	05X-13	Validità	06/08/2023
Riferimenti catastali	foglio XX particella XX sub. XX Roma		
Indirizzo edificio	Via Emanuele XXXXXX interno 1 Roma		
Nuova costruzione ☐	Passaggio di proprietà ☒	Riqualificazione energetica ☐	
Proprietà	XXXXX	Telefono	
Indirizzo	XXXX	E-mail	

2. CLASSE ENERGETICA GLOBALE DELL'EDIFICIO

Edificio di classe: G

3. GRAFICO DELLE PRESTAZIONI ENERGETICHE GLOBALE E PARZIALI

EMISSIONI DI CO_2 23.646 kgCO2/m²anno

PRESTAZIONE ENERGETICA RAGGIUNGIBILE 133.012 kWh/m²anno

PRESTAZIONE ENERGETICA GLOBALE 133.012 kWh/m²anno

LIMITE DI LEGGE

PRESTAZIONE RAFFRESCAMENTO 12.269 kWh/m²anno

PRESTAZIONE RISCALDAMENTO 65.266 kWh/m²anno

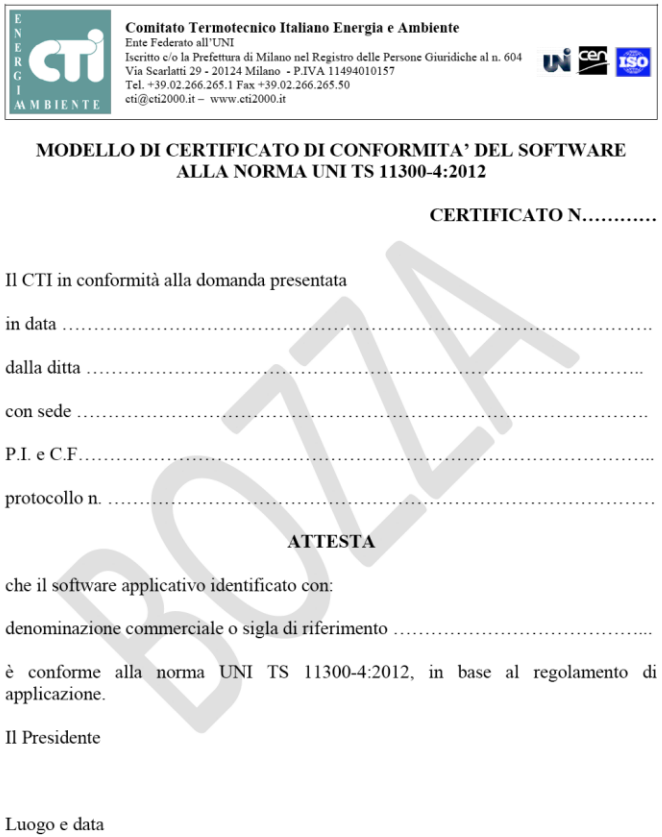
PRESTAZIONE ACQUA CALDA 67.746 kWh/m²anno

4. QUALITA' INVOLUCRO (RAFFRESCAMENTO)	I	☒	III	IV	V

BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION

ITALIAN NATIONAL CERTIFICATION FOR SIMULATION TOOLS

The CTI (Comitato Termotecnico Italiano) is the deputy organization that certificates simulation tools for energy calculation in agreeement with Italian legislation and technical regulatory framework.



Comitato Termotecnico Italiano Energia e Ambiente
Ente Federato all'UNI
Iscritto c/o la Prefettura di Milano nel Registro delle Persone Giuridiche al n. 604
Via Scarlatti 29 - 20124 Milano - P.IVA 11494010157
Tel. +39.02.266.265.1 Fax +39.02.266.265.50
cti@cti2000.it – www.cti2000.it

MODELLO DI CERTIFICATO DI CONFORMITA' DEL SOFTWARE ALLA NORMA UNI TS 11300-4:2012

CERTIFICATO N.....

Il CTI in conformità alla domanda presentata

in data .....

dalla ditta .....

con sede .....

P.I. e C.F.....

protocollo n. .....

ATTESTA

che il software applicativo identificato con:

denominazione commerciale o sigla di riferimento .....

è conforme alla norma UNI TS 11300-4:2012, in base al regolamento di applicazione.

Il Presidente

Luogo e data

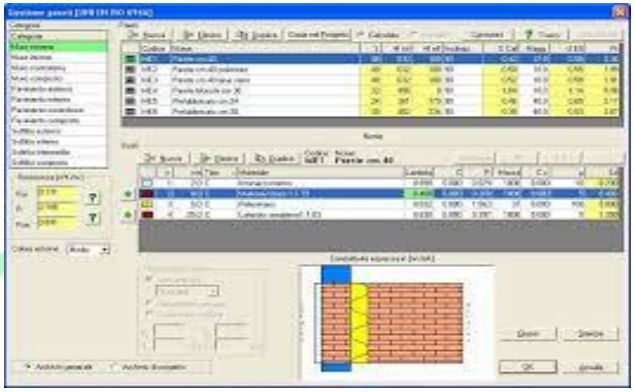
BOZZA

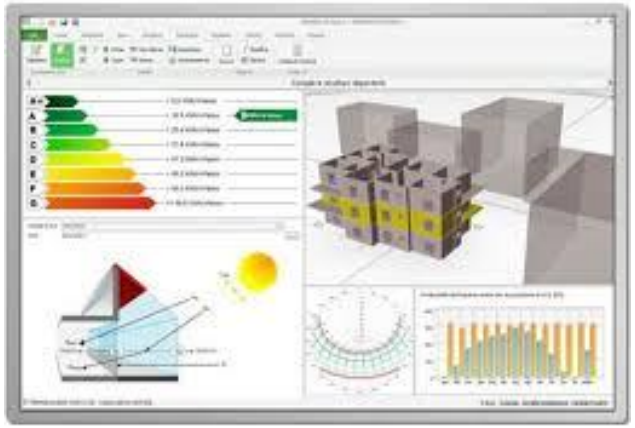
TO BE USED FOR ALL BUILDINGS AT NATIONAL LEVEL

BUILDING SIMULATION TOOLS FOR ENERGY PERFORMANCE CALCULATION AND VERIFICATION

TO DATE 30 COMMERCIAL SOFTWARE HOUSES OBTAINED THE CTI CERTIFICATE IN ORDER TO MATCH THESE TECHNICAL REGULATIONS:

- UNI TS 11300:1
- UNITS 11300:2
- UNI TS 11300:4





According to Italian Guidelines for Energy Performance Certification in Buildings (D.M. 36/06/2009), the maximum difference between results obtained with different certificated tools is +/- 5%

BUILDING MANAGEMENT AND CONTROL SYSTEMS

The BMS and BACS market in Italy is growing up quite fast, both in the public and private sector

Some Public Administrations require this kind of ITC technologies especially for some type of public buildings, such as:

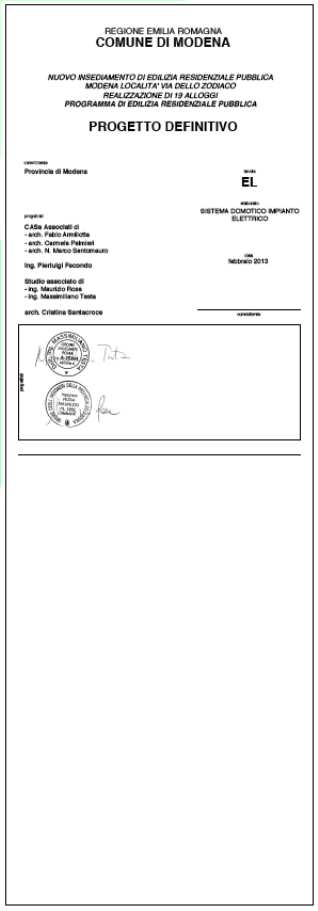
- schools;
- offices;
- social housing for elderly people;
- renewable energies systems

Barrier to market development:

high prices of BMS

Social Housing in Modena (Design Competition 2013)

BUILDING MANAGEMENT AND CONTROL SYSTEMS



REGIONE EMILIA ROMAGNA
COMUNE DI MODENA

NUOVO INSEDIAMENTO DI EDILIZIA RESIDENZIALE PUBBLICA
MODENA LOCALITA' VIA DELLO ZODIACO
REALIZZAZIONE DI 19 ALLOGGI
PROGRAMMA DI EDILIZIA RESIDENZIALE PUBBLICA

PROGETTO DEFINITIVO

committente
Provincia di Modena

scala
EL

elaborato
SISTEMA DOMOTICO IMPIANTO ELETTRICO

progettisti
CASa Associati di
- arch. Fabio Ambrotta
- arch. Carmela Palmieri
- arch. N. Marco Santonauro

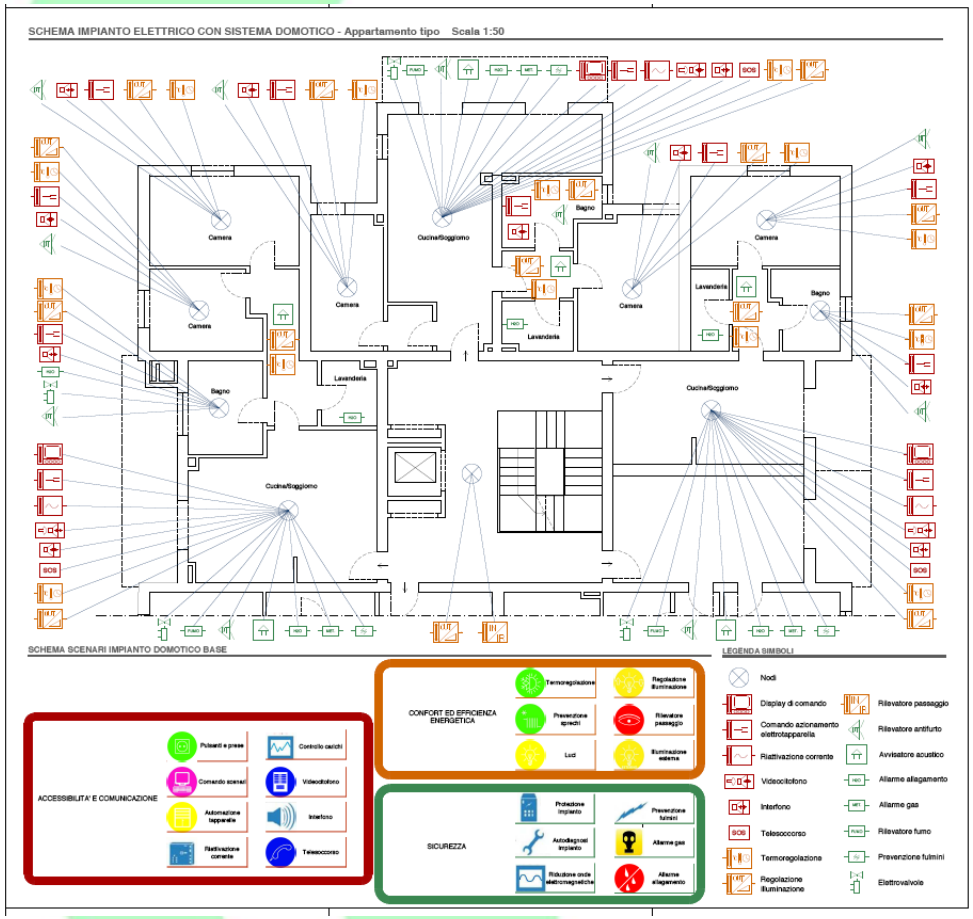
Ing. Pierluigi Fecondo

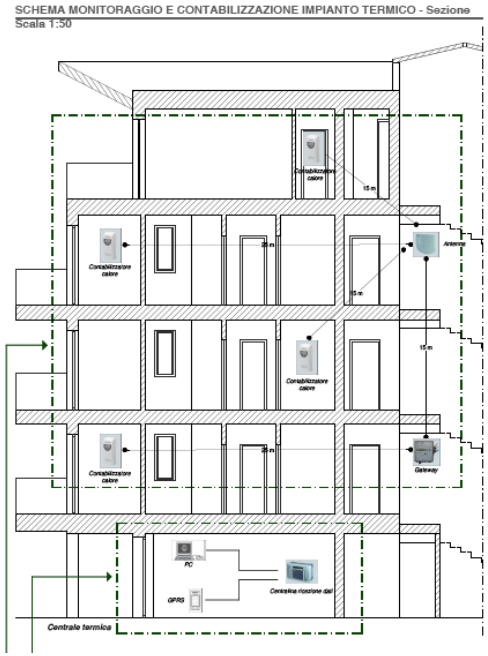
Studio associato di
- ing. Maurizio Rosa
- ing. Massimiliano Testa

arch. Cristina Santacroce

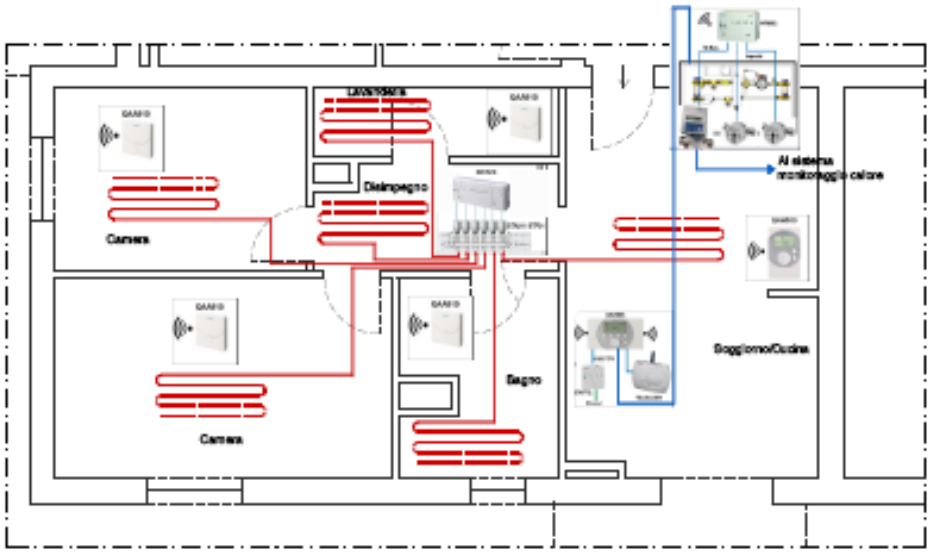
data
febbraio 2013

consulenze

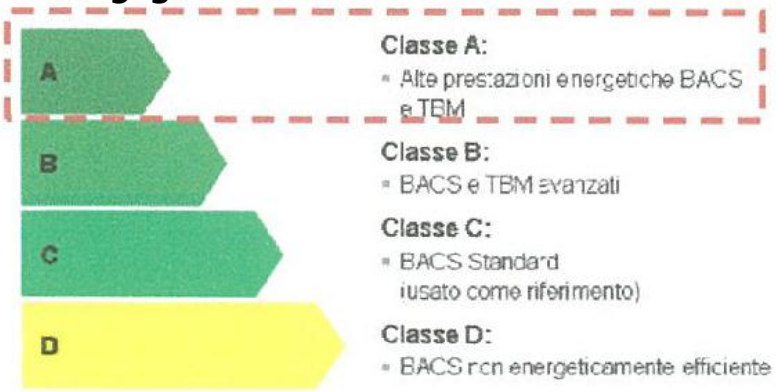




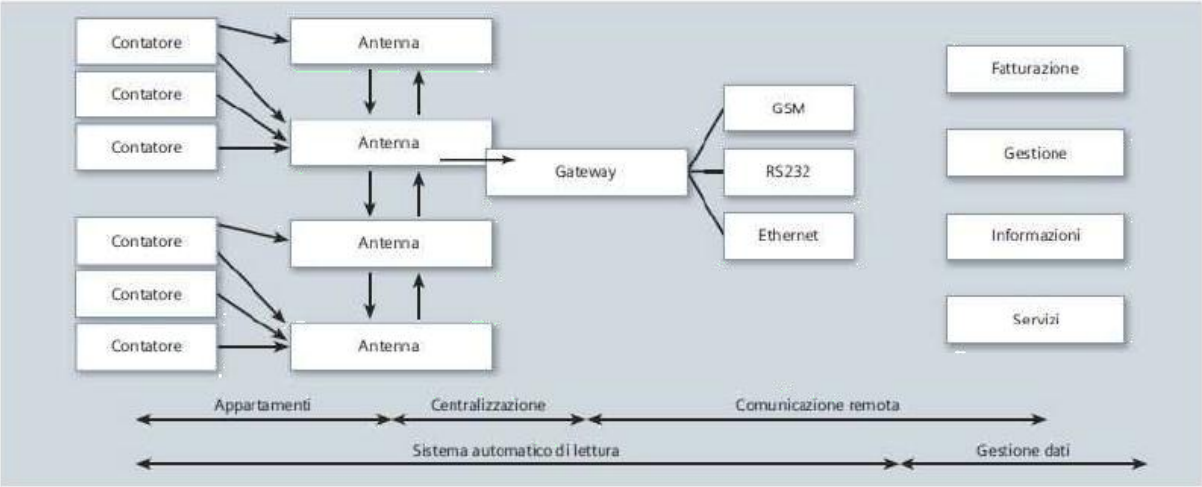
BUILDING MANAGEMENT AND CONTROL SYSTEMS



BACS Energy Efficiency compliant with EN 15232



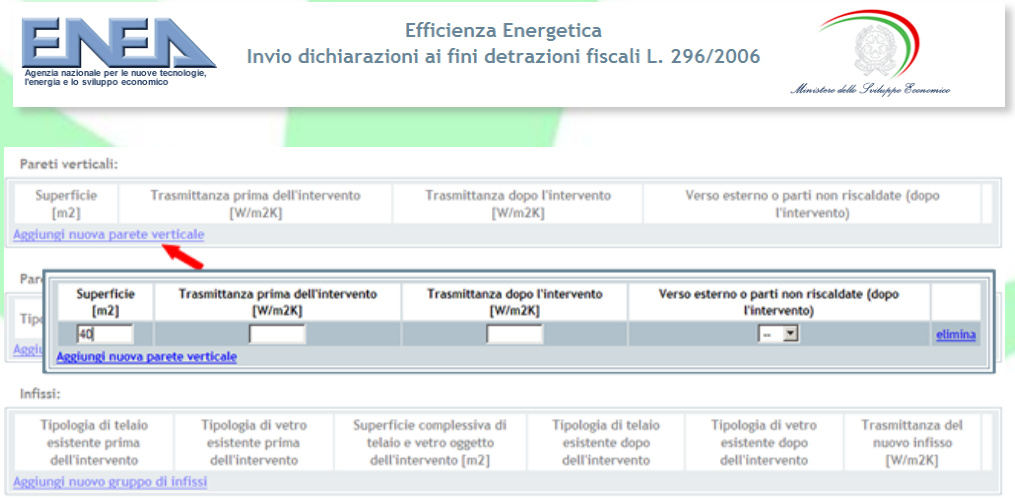
BACS – Building Automation and Controls System
TBM – Technical Building Management Systems

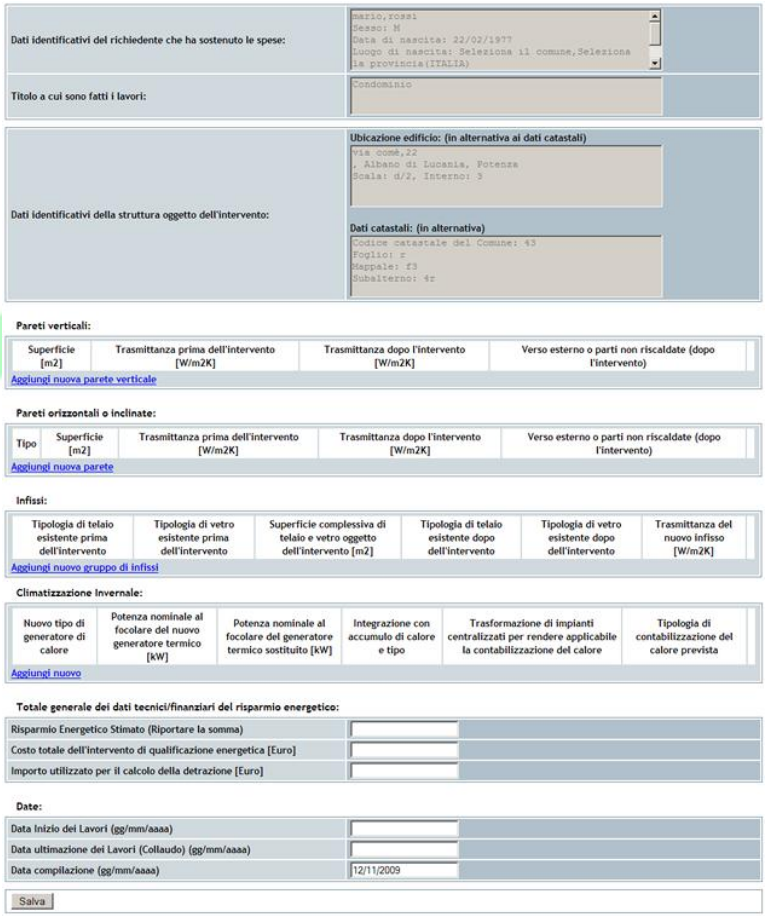


1. Acquisizione delle letture di tutti i contatori dell'appartamento

OTHER ICT IMPLEMENTATION

ENEA WEB – BASED APPLICATION FOR INCENTIVES IN BUILDING ENERGY EFFICIENCY RETROFIT INTERVENTIONS





Final users and professional technicians use this tool to send data about energy efficiency interventions on existing in order to gain fiscal incentives

(65% of eligible costs for envelope and heating systems)

OTHER ICT IMPLEMENTATION

WEB – BASED APPLICATIONS FOR DATA COLLECTION ABOUT BUILDING ENERGY PERFORMANCE CERTIFICATIONS (REGIONAL LEVEL)

Attestati trasmessi

Tipo	Codice	Data	Indirizzo edificio	CAP	Comune	Provincia
Edifici residenziali	6700400000000001	17/10/2012	Viale della Regione Siciliana 56	64032	Atri	TE
Edifici residenziali	6700400000000002	09/10/2011	Viale della Regione Siciliana 56	64032	Atri	TE
Edifici residenziali	6605700000000003	12/06/2013	Via vittorio Emanuele, 55	67050	Morino	AQ

Attestati in lavorazione

Tipo	Data	Indirizzo edificio	CAP	Comune	Provincia		
Edifici residenziali	28/08/2013	Via Contessa Entellina, 10	66040	Altino	CH	completa i dati inseriti	cancella il documento
Edifici residenziali	28/08/2013	Via delle Piane 11	67041	Aielli	AQ	completa i dati inseriti	cancella il documento

Each Region in Italy use its own web-based tool to collect EPC from final users.

IN ITALY THERE ISN'T A CENTRAL STORAGE DATABASE SYSTEM FOR EPC

THANK YOU FOR ATTENTION!

pierluigi.fecondo@centroabita.it