Royal Decree 56/2016-transposing Directive (EU)2012/27- ביקורות אנרגיה יפוקחו על ידי בעלי מקצוע שהוסמכו לכך.

לא יתבצעו בעסקים קטנים ובינוניים.

המידע הנדרש לביקורת זו דומה למידע על ביצוע הערכה לחתימת הפחמן של החברה. לכן, פיצויים בתחומים אלה ותמריצים יהיו דומים.

ביקורת אנרגיה צריכה להתבצע כל 4 שנים.

הדרישות והפיקוח גם רשומים והאדמיניסטרציה נוצרת במשרד לתעשייה ואנרגיה ותיירות.

ACP הארגון הראשון שנתן הסמכה בספרד

רמות הביצוע של האנרגיה צריכות להימדד באופן עונתי ולא חד פעמי בנק' בזמן כדי לכלול כמות גדולה ומשתנה של משתנים

ההערכה העונתית של גורם הביצועים הזה חייבת לכלול כלים מתאימים, איסוף נתונים וניתוח השוואתי. המדריך הטכני של IDAE מפרט את גורם הביצועים השנתי המתוקן (SPFc) בתור א

יחס יסודי. זוהי מדידה עונתית של הנתונים שנאספו במשך שנה, עם התוצאות

מנורמל כפליטת CO2, על מנת להסביר כראוי את התרומות של אנרגיה שונה

מקורות.

This is to say that the audit must carry out a study of energy use and the thermal behavior of the building envelope by using simulation tools to assess demand of the building and the predictions of consumption in the current state of the building with respect to compliance with the current regulations, or Technical Building Code (CTE). This will enable choosing of the most appropriate measures, their estimated cost and the subsidies that they are able to receive. This process will include the following phases:

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Lighting, boiler room, heating and DHW distribution, accountants, Some of the equipment used in the data collection for the audit are:

**Network analyzer-**calculate the different electrical parameters of a low voltage network:

Its components are: ▪ Recording/analyzing equipment. ▪ Three clamps – type current sensor. ▪ Four clamp meters for testing voltage. ▪ Data recorder. ▪ Cable and specific software for communication with PC and data processing software



**Flue gas analyzer**

This directly measures and calculates the different parameters that determine the characteristics of combustion in a certain fuel-consuming equipment: boiler, oven, engine, etc. The measured parameters are: ▪ Concentration of oxygen. ▪ Carbon monoxide (CO). ▪ Nitrogen oxides (NOX), ▪ Temperature of ambient air and gas. It is composed of: ▪ Analyzer equipment. Building energy management – Existing Buildings 9 © Structuralia ▪ Probe for gas sampling and draught measurement. ▪ Non-contact thermometer (for room temperature). ▪ Contact thermometer. ▪ Opacimeter



**Light meter-**It measures the illuminance or light level (lux) on a certain surface. It consists of the analyzer and the photosensitive probe.



**Flowmeter-**A portable, non-intrusive ultrasonic flowmeter is used to measure the volumetric flow without contact with the liquid in all areas where both the walls of the pipes and the liquid that circulates through them allow the propagation of sound.

A picture containing text, device, control panel

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**Thermographic camera-**only recommended for very specific cases.

Thermography is a graphical method of recording the heat emitted from the surface of a body in the form of infrared radiation. Thermographic cameras are devices that measure infrared radiation emitted by bodies and transform them into images

In an energy audit, thermography can be used to: ▪ Verify the insulation of the building. ▪ Locate deficiencies in the envelope. ▪ Find air infiltrations. ▪ Locate thermal bridges (in floor slabs, in window frames, etc.)

A picture containing light, microphone

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**Thermal Anemometer-** Measurement of air speed and calculation of volumetric flow. Composed of a turbine or vane probe. They also can have the ability to take relative humidity and temperature measurements.

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**Recorder with probes**

With the information available and attending to the main needs of the client, the following priorities will be established: ▪ Establish the minimum requirements of the envelope (facades, lower floors and roofs), which allow reduction of the maximum (> 40%) thermal transmittance (energy losses) required in order to apply for the subsidies established by the local administrations. ▪ Energy evaluation of the thermal consumption of heating production in both the current state of the building envelope and after the application of corrective measures. Likewise, consumption during the production of DHW will be evaluated. ▪ Energy evaluation of electrical consumers.

Determine the energy demand.

For the simulation of the buildings (models), one must be able to use a CALENER GT computer program or another recognized program. By using the data obtained from the simulation, a comparison with the historical data in order of magnitude is established. Electricity consumption versus thermal consumption loads must be established, as well as fluid movement, etc. in order to assess the improvements in terms of energy and economic savings.

Heating Oil is regulated in spain and most used to heat buildings.

**However**, there is no reference to the maximum or minimum heat value of this heating oil, unlike other liquid fuels

יותר כלכלי לקנות heating oil בתקופות פחות מבוקשות (סוף אביב וקיץ).

אסור להשתמש בsolid fuels לחימום בניינים מה1.1.12 כפי שנקבע ע"י הRITE.

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Since July 1, 2009, natural gas consumers with an annual consumption of more than 50,000 kWh have been required to contract their supply with a marketer at a price openly agreed upon by both parties.

The electricity price set by the market is the main component of the cost of electricity production, integrated in turn into the variable term of the invoice.

Set by energy consumption + contract term

Setting price by the government, not market.

Resellers are: Open market reseller companies-setting price freely, Reference reseller companies- setting price by government

There are three different types of rates depending on the time of use discrimination period:

▪ Rate 2.0A: rate **without hourly discrimination**. The variable term of the invoice does not vary depending on the time of day.

▪ Rate 2.0DHA: rate with time **discrimination in two periods**; 10 h/day peak (12:00-22:00 in winter; 13:00-23:00 in summer) 14 h/day off-peak.

▪ Rate 2.0DHS: rate with time **discrimination in three periods**; 10 h/day peak (13:00-23:00) 8 h/day half-peak (7:00-13:00 and 23:00-1:00), 6 h/day super off-peak (1:00-7:00).

With the hourly discrimination rates (2.0DHA and 2.0DHS), electricity is cheaper if it is not consumed during the peak period. This offers a third opportunity to reduce the cost of a bill by contracting a rate with time of use discrimination and transferring electricity use to the hourly period in which electricity is cheaper.

Graphical user interface, text

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The following instrumentation should not miss from the kit that the audit technician will carry:  
1. Network analyser  
2. Fuel gas analyser  
3. Lightmeter  
4. Flow meter  
5. Thermographic camera  
6. Thermal anemometer  
7. Recorder with probes

The steps for developing an audit are as follows:

1. Collect and analyze records of utility data.

2. Study the building and its operational characteristics.

3. Identify possible modifications that reduce energy use and/or cost.

4. Perform engineering and economic analysis of possible modifications. 5. Prepare a list ordered by range of appropriate modifications. 6. Prepare a report to document the analysis process and results.

The essential data that must be requested is listed below: General document data: ▪ Building ownership. ▪ Manager and contact person. ▪ State of the building. ▪ Program, building usage. ▪ Schedules and terms of use. ▪ Review of special areas or treatment different from the general building

Graphical user interface, application

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**In phase 1 of this analysis of the current state, these are the steps to follow:**

1. Assessment of the current state of the building
2. Data collection. Metering of energy consumption: Installation of equipment and preparation of assessment questionnaire
3. Study and analysis: Simulation, energy and consumption evaluation
4. Proposals for improvement measures: Passive measures: through actions on the thermal envelope of the building (roof insulation, facade walls, openings and floors); Active measures: through renovation, adaptation or implantation of facilities (solar thermal systems, lighting systems, replacement of lifting devices, replacement of central boilers, etc.)
5. Simulation, energy and economic evaluation of the proposed measures. Decision making

The installations for heating and cooling are made up of:

Heat generating equipment and DHW:

Cold water generating equipment:

The system of distribution of cold and heat to the fan-coils (FCs) of each apartment is carried out through constant flow pumping

The hot and cold water distribution system to the FCs is carried out through columns

e. The hot and cold water distribution system presents problems in the connections to the fan coils, probably due to galvanic corrosion of the shut-off valves. The building's HVAC facilities are very inefficient and contribute to the energy rating of F, so the aim is to achieve a higher rating, so that the facilities produce energy savings and take advantage of the IBI rebate proposed by PGEs (state budgets) with a reduction of up to a 20% for energy rating A.

For a home, residential building or small commercial building, the essential equipment is a measuring device to draw up a plan of the home and a photo camera, as well as a flashlight and magnifying glass to see the equipment sheet. If we are going to do an audit of an office building, we should include a light meter and a thermometer to verify the lighting and comfort conditions.

▪ We must adjust the time frame by bringing those of the model closer to reality and other parameters, so that the results approximate the actual average consumption. Let’s consider the adjusted model when the deviations of the real data do not exceed 20% of the data.