



**Bucharest
Municipality**



**Primaria Municipiului
Bucuresti**

Contract 4144 / 31.12.07

Contract 4144 / 31.12.07

**Energy Strategy for Bucharest
Municipality**

**Strategia Energetica a
Municipiului Bucuresti**

Phase III: Strategy Report

Etapă a III-a: Strategia

**Part C: Technical Note
26.08.2009**

**Partea C: Nota tehnica din data
de 26.08.2009**

**Impact of delayed
implementation**

**Impactul intarzierii
implementarii**

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1 INTRODUCTION

The Consultant is requested to analyse the impact of delaying the implementation of the Energy Strategy with 5 respectively 10 years. This means that the goals established for 2020 will only be reached in 2025 or 2030.

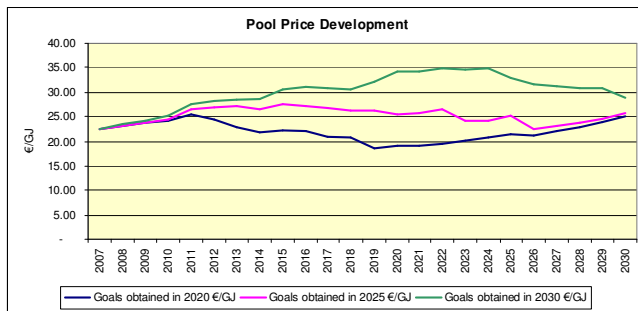
1 INTRODUCERE

Consultantul a primit solicitarea de a analiza impactul intarzierii implementarii Strategiei Energetice a Municipiului Bucuresti cu 5, respectiv 10 ani. Aceasta inseamna ca obiectivele stabilite pentru anul 2020 vor fi atinse in 2025 sau 2030.

2 CONCLUSION

2.1 Heat price, EUR/GJ

Delaying the implementation will impact the pool price¹ of heat:



In the baseline scenario, blue curve – Goals obtained by 2020, it will be possible to reduce the tariff from 2012 when the first local peak-load boilers are installed and the first solar panels starts production. After 2020 the heat price will increase following the general price increases in the society.

In the 5-year delayed scenario, pink curve – Goals obtained by 2025, the heat price will continue to increase until after 2015 where the proposed measures take effect. After 2015 we'll see a decreasing heat price until 2025.

In the 10-year delayed scenario, green curve – Goals obtained by 2030, the heat price will continue to increase until about 2020 where it is stabilised. After 2025 we'll see a decrease in the heat price.

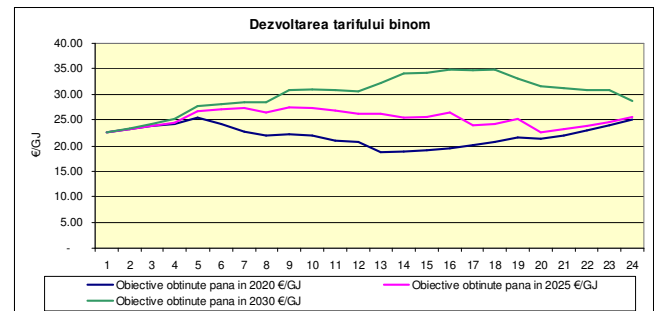
2.2 Production costs, EUR/y

Due to delay in commissioning of the proposed cheaper production facilities, especially waste-to-energy and solar heating systems, the annual production costs will be much higher in the delayed scenarios than in the baseline scenario.

2 CONCLUZIE

2.1 Pretul energiei termice, EUR/GJ

Intarzierea implementarii va avea un impact asupra pretului binom¹ al energiei termice:



In scenariul de baza, curba albastra - Obiective obtinute pana in 2020, va fi posibila reducerea tarifelor incepand cu 2012, cand vor fi instalate primele cazane locale pentru acoperirea varfului de sarcina si cand vor incepe sa produca primele panouri solare. Dupa 2020, pretul energiei termice va creste ca urmare a cresterii generala a preturilor in societate.

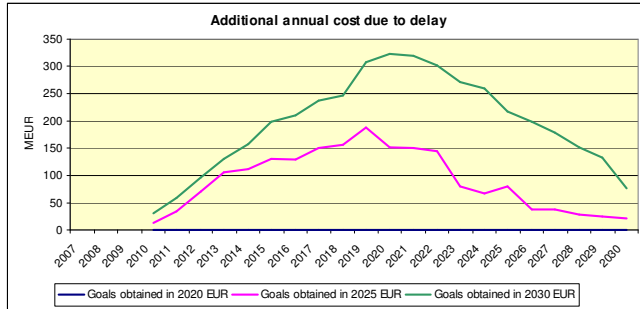
In scenariul cu o intarziere de 5 ani, curba de roz - Obiective obtinute pana in 2025, pretul energiei termice va continua sa creasca, pana cand, dupa anul 2015, masurile propuse vor avea efect. Dupa 2015 vom vedea o scadere a pretului pana in 2025.

In scenariul cu o intarziere de 10 ani, curba verde - Obiective obtinute pana in 2030, pretul energiei termice va continua sa creasca pana in 2020, cu aproximatie, cand se va stabili. Dupa 2025 vom vedea o scadere a pretului energiei termice.

2.2 Costurile de productie, EUR/an

Din cauza intarzieri in punerea in functiune a instalatiilor propuse, care pot produce energie ieftina, in special a sistemele de incinerare a deseurilor cu recuperarea caldurii si sistemele de incalzire solara, costurile anuale de productie vor fi mult mai mari in scenariile cu intarzierii decat in scenariul de baza.

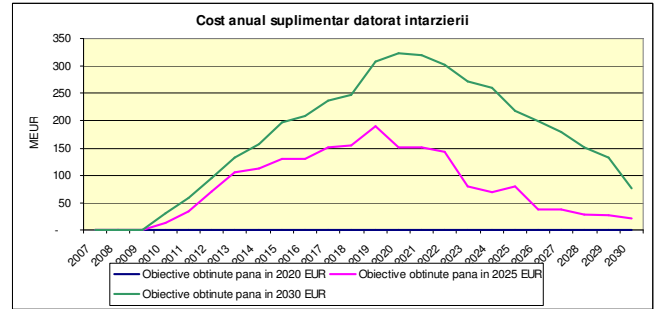
¹ The pool price of heat is the price the distribution companies pay for heat supplied by the Transmission Company/Pretul binom al energiei termice este pretul pe care il platesc companiile de distributie pentru energia termica furnizata de compania de transport.



The baseline scenario, blue curve – Goals obtained by 2020, is as reference set to zero.

The addition production costs is in the 5-year delayed scenario, pink curve – Goals obtained by 2025, show additional production costs of up to about 180,000,000 EUR/y. The total extra production costs for the period 2010 to 2030 will be about 2,000,000,000 EUR.

The additional production costs is in the 10-year delayed scenario, green curve – Goals obtained by 2030, show additional costs of up to more than 300,000,000 EUR/year. The total extra production costs for the period 2010 to 2030 will be about 4,000,000,000 EUR or about 1,000,000,000 more than to be invested for obtaining the baseline scenario.



Scenariul de baza, curba albastra – Obiective obtinute pana in 2020, este setat ca referinta la zero.

Costurile de productie suplimentare in scenariul cu o intarziere de 5 ani, curba roz – Obiective obtinute pana in 2025, arata o cresterea de pana la circa 180.000.000 EUR/an. Costurile suplimentare totale de productie pentru perioada 2010-2030 vor fi de circa 2.000.000.000 EUR.

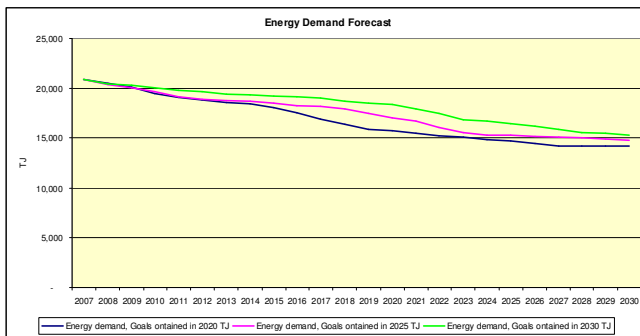
Costurile de productie suplimentare in scenariul cu o intarziere de 10 ani, curba verde – Obiective obtinute pana in 2030, arata o cresterea de peste 300.000.000 EUR/an. Costurile suplimentare totale de productie pentru perioada 2010-2030 vor fi de circa 4.000.000.000 EUR sau cu aprox. 1.000.000.000 mai mult decat ar trebui investit pentru a obtine scenariul de baza.

3 DETAILED ANALYSE

3.1 Energy conservation

Consumer level

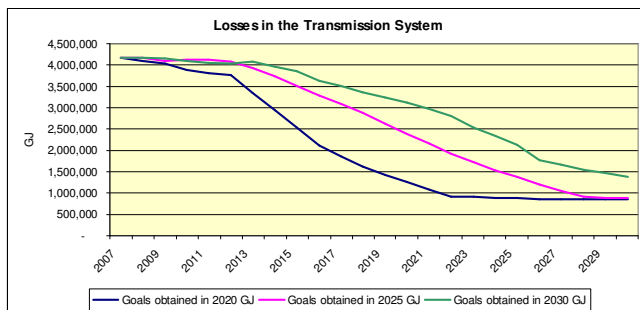
The impact of delaying the energy conservation at the consumers will delay the reduction in demand:



Denying the consumers the energy conservation means a higher heat bill making it even more difficult/painful to remove the general subsidises and also for the local budget (social welfare).

Network losses

A higher demand as show in previous section together with delay in moving the production from the centralised level to the decentralised/local levels means that the reduction in diameters and lengths of the transmission system will be delayed correspondingly. This impact the heat losses as shown:



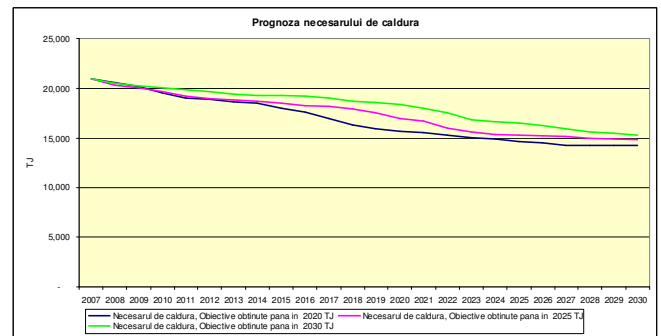
The impact in terms of costs are for the period 2010-2030 about 500,000,000 EUR (5 years delay) and 1,000,000,000 EUR(10 years delay), respectively:

3 ANALIZA DETALIATA

3.1 Conservarea energiei

La nivel de consumator

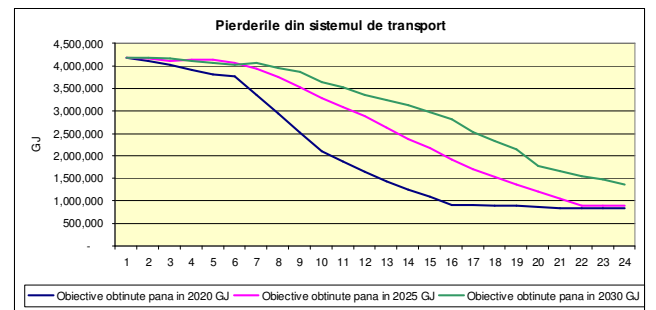
Impactul intarzierii conservarii energiei la nivel de consumator va intarzia reducerea cererii:



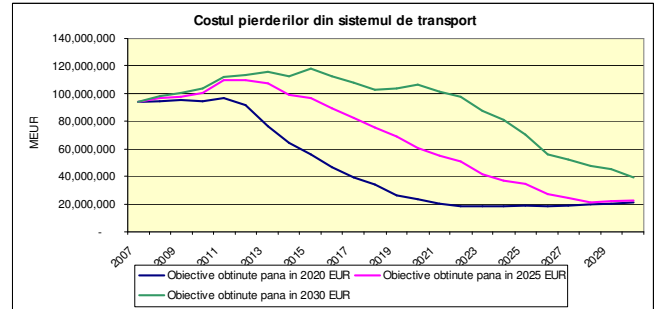
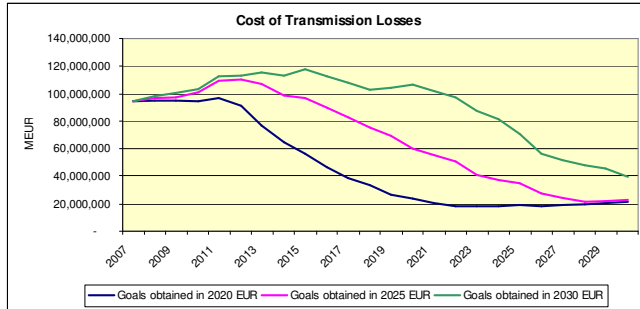
Refuzarea masurilor de conservarea a energiei consumatorilor inseamna o factura de energie termica mai mare, facand ca eliminarea subventiilor generale sa fie pentru consumatori mult mai greu de suportat dar si pentru bugetul local (ajutorul social).

Pierderile de pe retea

O cerere mai mare dupa cum se arata in sectiunea anterioara, impreuna cu intarziere mutarii productiei de la nivel centralizat la nivel descentralizat/local inseamna intarzierea corespunzatoare a reducerii diametrelor si lungimilor sistemului de transport. Impactul asupra pierderilor de caldura este urmatorul:



Impactul in ceea ce priveste costurile pentru perioada 2010-2030 reprezinta 500.000.000 EUR(5 ani intarziere) si respectiv 1.000.000.000 EUR(10 ani intarziere):



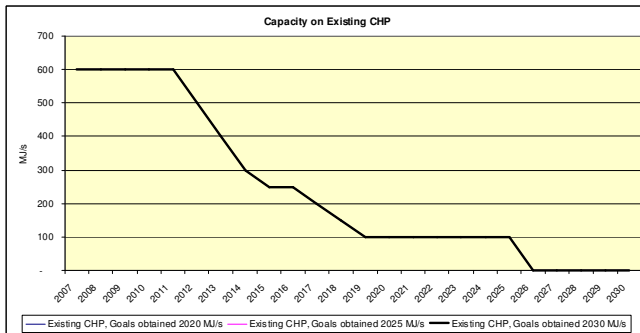
3.2 Production Option

Existing CHP

Most of the existing CHP capacity has passed its useful lifetime long ago and is today operated downgraded and with low efficiency.

The base-line scenario (Goals obtained by 2020) assumes some of the capacity life extended to be in operation after 2020. However, it cannot be considered technical possible to life extent the lifetime additionally.

Thus the capacity is the same in all scenarios:

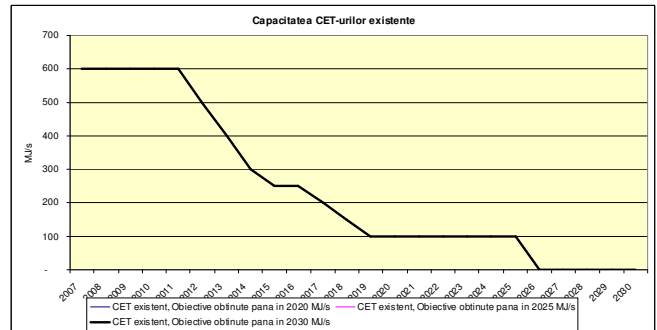


3.2 Optiunea privind producere

CET existent

Majoritatea capacitatilor de cogenerare si-au depasit durata de viata utila in urma cu mult timp si astazi functioneaza si echipamente inechitate si cu eficienta scazuta.

In scenariul de baza (Obiective obtinute pana in 2020) se presupune ca durata de viata a unora dintre capacitati sa fie extinsa pana dupa 2020. Totusi, din punct de vedere tehnic nu putem considera posibila extinderea duratei de viata suplimentar.



Existing Heat-only Boilers

Production from the existing heat-only boilers is the most expensive production in the system considering that the production must also carry the high transmission costs. The goal is thus to replace the centralised heat-only boiler production by energy conservation and construction of cheaper production sources enable reduction of the diameters and length on the transmission system.

Some of the existing heat-only boilers are assumed rehabilitated and used as local heat-only boilers in the future (this means connected to the distribution network and disconnected from the transmission network).

Delay in construction of new production capacity lead

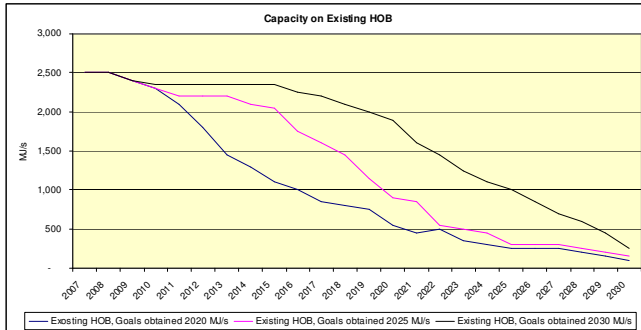
CAF-urile existente

Productia de la CAF-urile existente este cea mai costisitoare din intreg sistemul avand in vedere faptul ca productia trebuie sa suporte si costurile mari de transport. Obiectivul este de a inlocui productia centralizata prin introducerea masurilor de conservare a energiei si construirea unor surse de productie mai ieftine care vor permite reducerea diametrelor si lungimilor sistemului de transport.

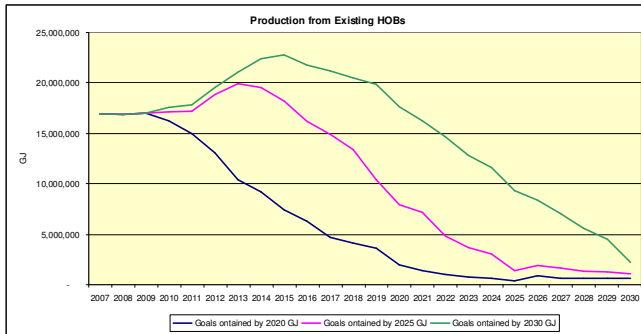
Se presupune ca unele dintre CAF-urile existente vor fi reabilitate si vor fi folosite ca CAF-uri locale in viitor (aceasta inseamna ca vor fi conectate la reseaua de distributie si vor fi deconectate de la reseaua de transport).

Intarzierea construirii noilor capacitati de productie

to delay in decommissioning of the existing heat-only boilers:



In terms of energy production the production from existing heat-only boilers will be increased:



Over the period 2010 to 2030 the existing heat-only boilers will produce additionally about 100,000,000 GJ in the 5-year delayed scenario and about additionally 200,000,000 GJ in the 10-year delayed scenario.

The tariff for existing HOBs increases over the 20-year period from about 12 EUR/GJ to about 40 EUR/GJ. In contrast the price of production replacing the existing heat-only boilers, solar energy and waste-to-energy, increases far less; From about 5 EUR/GJ to about 6 EUR/GJ and from about 10 EUR/GJ to about 25 EUR/GJ, respectively.

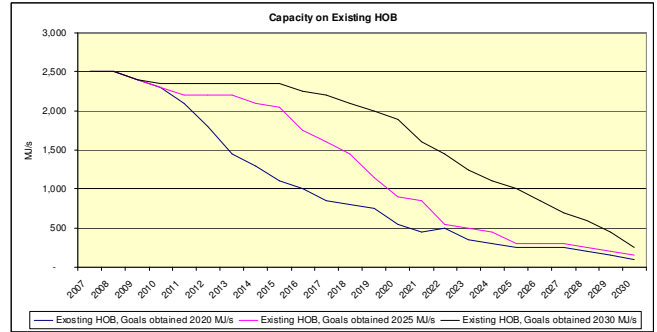
Solar Heating Systems

Installation of solar panels aims to reduce the heat tariff as this option is only second to waste-to-energy in terms of low production costs.

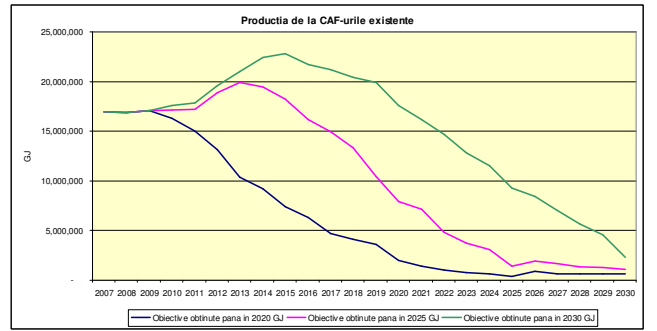
If supported by the Romanian government as currently discussed solar heating will be the cheapest production source in the system and will significantly reduce the heat bills.

Delay in implementation will reduce the production from solar heating systems:

va conduce la intarzierea dezafectarii CAF-urilor existente:



In ceea ce priveste productia de energie de la CAF-urile existente, aceasta va creste:



In perioada 2010 – 2030 CAF-urile existente vor produce suplimentar aproximativ 100.000.000 GJ in scenariul cu o intarziere de 5 ani si circa 200.000.000 GJ in scenariul cu o intarziere de 10 ani.

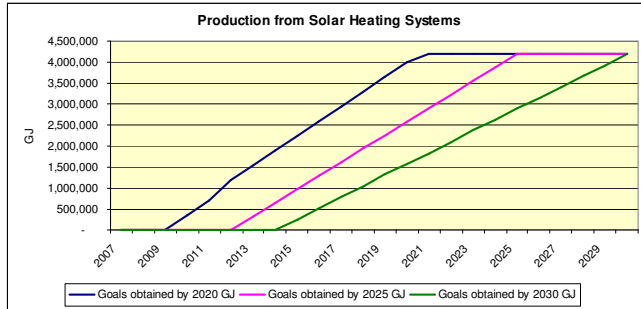
Tariful pentru CAF-urile existente va creste in urmatoorii 20 de ani de la cca 12 EUR/GJ la aprox. 40 EUR/GJ. In contrast pretul productiei care va inlocui CT-urile existente, energia solara si incinerarea deseurilor va creste mult mai putin, de la aprox. 5 EUR/GJ la aprox. 6 EUR/GJ si respectiv de la cca 10 EUR/GJ la cca 25 EUR/GJ.

Sistemele de incalzire solara

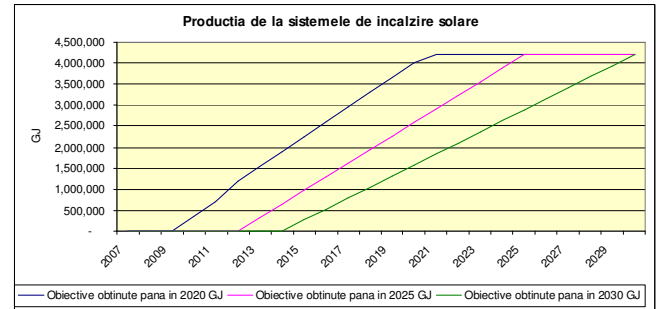
Instalarea de panouri solare are drept scop reducerea tarifului de caldura intrucat aceasta optiune este a doua, dupa statiile de incinerare a deseurilor din punct de vedere al costurilor de productie reduse.

Daca este sustinuta de catre guvernul roman, dupa cum se discuta in prezent, energia solara va fi cea mai ieftina sursa de productie din sistem si va reduce semnificativ facturile de caldura.

Intarzierea implementarii, va reduce productia de la sistemele de incalzire solara:



The production will decrease over the 20-year period from about 66,000,000 GJ the baseline scenario (blue curve – Goals obtained by 2020) to about 50,000,000 GJ in the 5-year delay scenario (pink curve – Goals obtained by 2025) and to about 35,000,000 GJ in the 10-year scenario (green curve – Goals obtained by 2030).



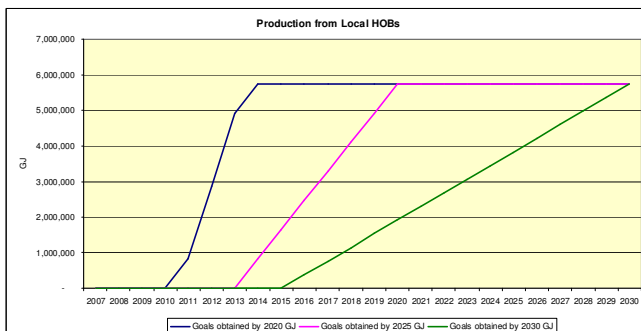
Productia va scadea in urmatoorii 20 de ani de la aproximativ 66.000.000 GJ in scenariul de baza (curba albastra – Obiective obtinute pana in 2020) pana la cca 50.000.000 GJ in scenariul cu o intarziere de 5 ani (curba roz – Obiective obtinute pana in 2025) si la aproximativ 35.000.000 GJ in scenariul cu o intarziere de 10 ani (curba verde – Obiective obtinute pana in 2030).

Local Heat-only Biolers

Moving the peak-load production from the centralised level (the current large plants) aim to reduce the size of the transmission system and the huge related heat losses.

Delay in construction of the heat-only boiler production (peak-load production) means that the centralised heat-only boilers must remain in operation for more years. Reducing the diameters of the transmission system must be delayed correspondingly and the high heat losses will remain.

Delay in construction of the local heat-only boilers will reduce the local production:

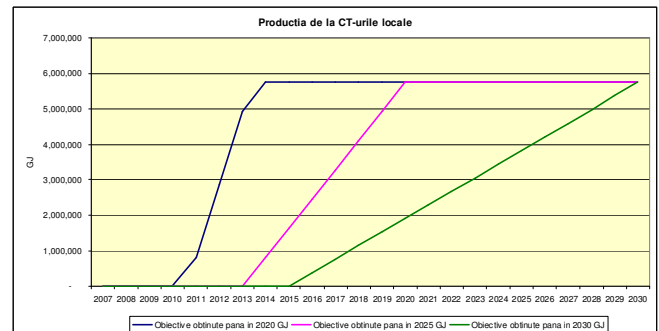


CT-uri locale

Mutarea productiei pentru acoperirea varfului de sarcina de la nivel centralizat (CAF-urile de la centralele mari existente) are drept scop reducerea dimensiunii sistemului de transport si a pierderilor imense de caldura aferente.

Intarzierea realizarii productiei de la CT-urilor locale (productie pentru acoperirea varfului de sarcina) inseamna ca se vor mentine in functiune CAF-urile centralizate pentru mai multi ani. In consecinta, reducerea diametrelor sistemului de transport va fi intarziata si pierderile mari de caldura vor ramane.

Intarzierea construiii CT-urilor locale vor reduce productia locala astfel:



Decentralised CHP

CET descentralizat

Construction of decentralised CHP aim to reduce the centralised production to waste-to-energy production and thus reducing the sizing of the transmission system and reduce the current huge heat losses.

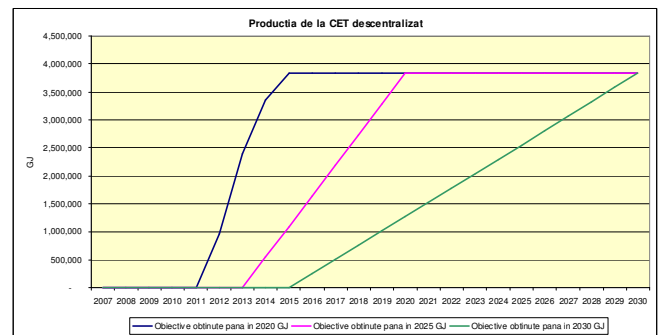
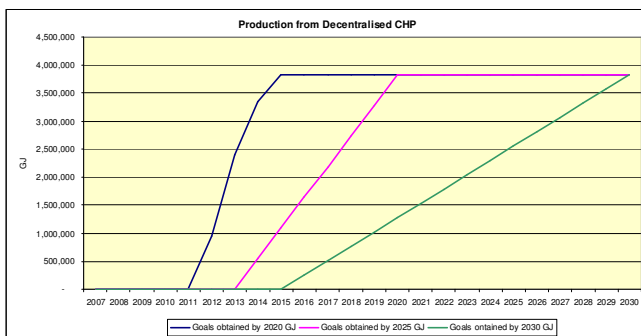
Construirea unei centrale de cogenerare descentralizate vizeaza reducerea productiei centralizate doar la nivelul productiei de la statiile de incinerare a deseurilor si in consecinta, reducerea dimensiunii sistemului de transport corespunzator cu reducerea pierderilor imense de caldura actuale.

Thus, delay in construction of the decentralised CHP units will delay the reduction of the transmission system and require the expensive production on existing facilities maintained for a longer period.

Astfel, intarzierea construirii unitatilor de cogenerare descentralizate va intarzia reducerea dimensiunii sistemului de transport si va mentine productia costisitoare de la instalatiile existente pentru o perioada mai lunga.

Delay in construction of the decentralised CHP units will reduce the decentralised production:

Intarzierea construirii unitatilor de cogenerare descentralizate va reduce productia descentralizata:



Waste-to-Energy Facilities

Statiile de incinerare a deseurilor cu recuperare caldurii

Heat recovering from waste incineration is the backbone in cheap district heating supply in most district heating countries.

Caldura recuperata de la statiile de incinerare a deseurilor reprezinta coloana vertebrala in furnizarea de energie termica ieftina in majoritatea tarilor cu termoficare.

Delay in construction of these facilities will not only delay the access to cheap energy for the district heating system but also delay solving the waste problem in Bucharest. Delay will reduce the cheap production:

Intarzierea construirii acestor facilitati nu numai ca va intarzia accesul la energie ieftina pentru sistemul de termoficare dar, va intarzia si rezolvarea problemei deseurilor in Bucuresti. Intarzierea va reduce productia ieftina astfel:

