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The Impact Of Green Finance On The National Debt: Model Analysis Of Cdp And Evaluation Of The Intensity Of Mission

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53rd ERSA Congress
Regional Integration:
Europe, the Mediterranean and the World Economy

27-31 August 2013, Palermo, Italy

**THE IMPACT OF GREEN FINANCE ON THE NATIONAL DEBT: MODEL
ANALYSIS OF CDP AND EVALUATION OF THE INTENSITY OF
MISSION**

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SUMMARY

The idea of supporting the implementation of energy-saving policies to protect the environment, in line with the provisions of the European Union (Agenda 21 and the Kyoto Protocol) through virtuous actions to reduce costs in the delivery of public services, is framed in the separate management of the *Cassa Depositi e Prestiti* (CDP) which, in Italy, finances about 40% of the national debt. The research team, after estimating the demand for financing of the public debt that the CDP model is today able to meet, analyzes the impact that such a model would have on the budgets of local entities both in terms of improvement in the credit standing of local entity, both in terms of reducing the cost of management of main public infrastructure.

The analysis was carried out through the construction of an indicator of the intensity of the mission that some instruments of green finance may now express than the classical finance of support to local entity, expressed by the system of the national credit. For the purpose of structuring the simulation model, the research team, after having studied a financial format of sustainability in the field of school construction, introduced logistical functions of saturation of the population in order to estimate the extent of beneficiaries (public bodies) that in the next 10 years would benefit the main instruments of green finance, evaluating the same time the recovery of financial efficiency that the national system could get.

1. INTRODUCTION

The Energy Service Company (ESCO also called) are companies which carry out actions to improve energy efficiency, taking upon himself the risk of the initiative and freeing the end user from any organizational effort and investment. The economic savings obtained are shared between the ESCO and the final customer with different types of trade agreement. Usually the intervention methodology is divided into the stages of "Energy Diagnosis" designed to identify waste, inefficiency and misuse that produces the elements to prepare a rough draft of the measures to be implemented and the management and maintenance of the plants to all over the agreed period. This type of actions, capable of ensuring budgetary savings through the introduction of technology (eg Led, photovoltaic, thermal, wind, etc ...) to cover obligations necessary for the realization of the investment, expresses a significant market whose size could already in first instance be estimated from the analysis of the consolidated financial statements of the local entity, from the analysis of georeferenced maps (GIS) and from the satellite data (SAR) today normally available by the local entity and by the national agencies in order to estimate with sufficient accuracy the potential of renewable energy actually achievable in "public areas" from sources such as wind, off-shore wind, hydro, mini-hydro, photovoltaic, thermal,

With the ability to access a service of qualified experts, the ESCO allow you to achieve the following results:

- Improve the quality of energy services to the network;
- Improve the reliability of the plants;
- Increased speed in making investments;
- Creation of interventions of the high energy efficiency without investment;
- Transfer of the responsibility of the managing to the ESCO;
- Savings in costs of energy;
- Respect and continuous updating to the reference legislation for their plants ;
- Solutions addressed to the resolution of specific needs;
- Operating costs and lower maintenance procedures and optimized in terms of energy performance in the long term;
- A prospective enhancement for the improvement of environmental conditions in your business / home.

After the significant innovations introduced since 2005, the CDP has improved the performance in terms of increased market share in respect of the main objectives assigned to the *mission* of the separate management. The introduction of additional lines of innovation concerning extended range of services in fact has made sustainable the transition from a trade policy based on the "*transaction*" to a policy characterized by "*relationship*", with expected further improvement in compliance with the needs of an increasingly sophisticated. The scenario of the actors involved in the requests for financing is structured in Great Public Entities (*GRANDI ENTI*) and Public Entities (*ENTI*). In particular, if for Public Entities, CDP represents *the interlocutor for antonomasia*, for the Great Public Entities, CDP is only a *privileged interlocutor* although overall all offered services enjoy a wide favor at both *clusters* and there are no apparent criticalities. The products/services currently provided by CDP to its customers are financial products of "*transaction*" (mortgages), the rest of the market is served by other banks, mostly local, with forms of financing not covered by CDP (bonds / securitization) and / or substitute products (other loans). The segmentation of the market made in the survey of *Customer Satisfaction* at the customers of the separate management, locates in 5,482 subjects users of products / services of the CDP to which must be added 2,745 more potential customers (*ALTRI CLIENTI POTENZIALI*) that today are not served by CDP.

STRUCTURE OF THE MARKET	Absolute values		values %
GREAT PUBLIC ENTITIES	163		1,98%
Regions and Aut. Prov.		21	
Provinces		62	
Chief town		66	
Not Chief town		14	
PUBLIC ENTITIES	5319		64,65%
Regions and Aut. Prov.		0	
Provinces		33	
Chief town		32	
Not Chief town		5254	
MORE POTENTIAL CUSTOMERS	2745		33,37%
Regions and Aut. Prov.		0	
Provinces		8	
Municipalities		2737	
Total	8227		100%

Source: Based on data from Ipsos - March 2009

	2006	2007	2008	2009
The Central Administrations	50,80%	52,20%	54,60%	56,61%
Entities	28,50%	30,50%	33,90%	36,98%
Regions	17,60%	18,30%	22,60%	25,70%
Local Entities	42,90%	44,80%	46,10%	47,79%
Non-Territorial Entities	6,60%	6,60%	9,40%	11,39%
Market Shares of CDP	36,20%	37,90%	40,90%	43,48%

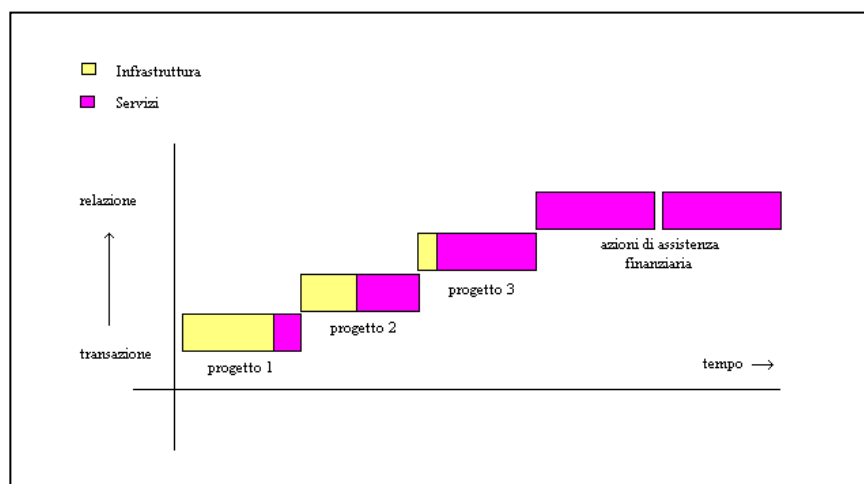
Source: Projected of the market shares of CDP on historical data the Bank of Italy 2006-2009

The CDP performance in terms of improving of the market shares would be closely related to an predictable increase of loans in countertendency respect to a recessionary environment, provided that alternative products are introduced to effectively counter threats from other banking institutions

and from new tools financial. So, in the implementation of measures undertaken by Entities, the *Cassa Depositi e Prestiti* could promote the following *green actions*:

- A) The involvement of local ESCO in the development strategy of the project;
- B) The Birth of a NEW ESCO between regional bodies such as CEV (now owned by ANCI), a Consortium of PMI holders of technology and CDP (through a fund established for this purpose);
- C) Mapping of public subsidies able to co-finance individual projects (Por, Fas,)
- D) Preparation of a feasibility study (market research / testing of a pilot project)
- E) Appointment of one or more representatives CDP for the supervision and implementation of the project.

The green finance is an example of innovation in the delivery of instruments more in line with the needs of customers and it set against to improvement in the sovereign debt markets. However, there remain gaps in bank lending rates, which reflect both the delays with which changes in the listed shares of state are transmitted to the conditions of the credit market that the effect of the unfavorable economic situation on the credit of the banking customers. In essence, the tensions that affect the public securities market continue to constrain the ability of banks to finance themselves on the markets. The forecasts of the Bank of Italy identify, in fact, a pejorative scenario marked by a strong political uncertainty, the acceleration of the dynamic in yields of government bonds that lead to an increase in interest payments on the public debt and the need to produce the due correctives, could generate additional depressant effects on economic growth, inevitable reflexes on the demand for credit and the quality of the same.



2. METHODOLOGY

The working method used was the following: (i) analysis of the main indicators expressed by the CDP model, (ii) identification of the parameters needed to adapt the functions of saturation respect to the macro sectors, (iii) elaboration of the simulation tool on the impact that the green finance could have the next 10 years on the market shares CDP and final conclusions. The publication of this work is, therefore, a development of the work presented at the annual conference AISRE 2013 on the predictive capabilities of mathematical models based on logistic functions even in the presence of clusters between them in competition, and validates the effort put in place by the research team to make known to the scientific and industrial/commercial community, the stages of development of the tool presented here, so that they are always more usable, simulation tools reliable that help the processes of *governance* of a local system of the development, supporting also the choices of strategic development and positioning of land on domestic and international markets.

3. FOCUS: THE CONSTRUCTION OF THE LOGISTICS FUNCTION IN PUBLIC FINANCE

As studied, analyzed and presented in the cited work of M.A.Maggioni (Univ. Cattolica) and A.Q.Curzio (Univ. Cattolica; Accademia Lincei) e M.Fortis (Fond. Edison; Univ.Cattolica) from the title “*Complessità e Distretti Industriali*”, Il Mulino (2002), there is a real ecology of clusters that can be applied to industrial clusters but also to other types of clusters formed by families, non-profit organizations, associations, etc. .. Why such a theory can be applied it is necessary that the benefits of the localization / choice to enter or remain in the cluster may be represented by a decreasing function of concave type and costs by an increasing function of the convex type.

With reference to the clusters of firms, we can say that firms decide to settle in a territorial cluster on the basis of expected profitability arising from the location in it; the profitability depends on the net benefits of localization (the difference between gross benefits and costs) based on elements observable. So the gross profits localization Bf_q for an enterprise f located in the cluster q are the sum of geographical benefits Gf_q and benefits of agglomeration Af_q .

The benefits Gf_q depend on the intrinsic characteristics of the geographic site (capital, labor, efficiency of suppliers, infrastructure):

$$Gf_q(k_q, l_q, s_q, u_q)$$

The benefits of agglomeration Af_q depend on the number of businesses located (concave function, non-monotonic)

$$Af_q(n_q)$$

So the gross profits of localization initially increase because of economies of agglomeration and then decrease when the congestion more than compensates for economies of agglomeration

$$Bfq = Gfq(kq, lq, sq, uq) + Afq(nq)$$

Similarly, in a symmetrical way, localization costs cfq for an enterprise f located in the cluster q are the sum of geographical costs gfq and costs of agglomeration afq .

The geographical costs gfq depend on the intrinsic characteristics of the geographic site (wages, interest rate, average price of services, tax rate)

$$gfq(wq, rq, dq, tq)$$

The costs of agglomeration afq depend on the number of businesses located (convex function, non-monotonic)

$$afq(nq)$$

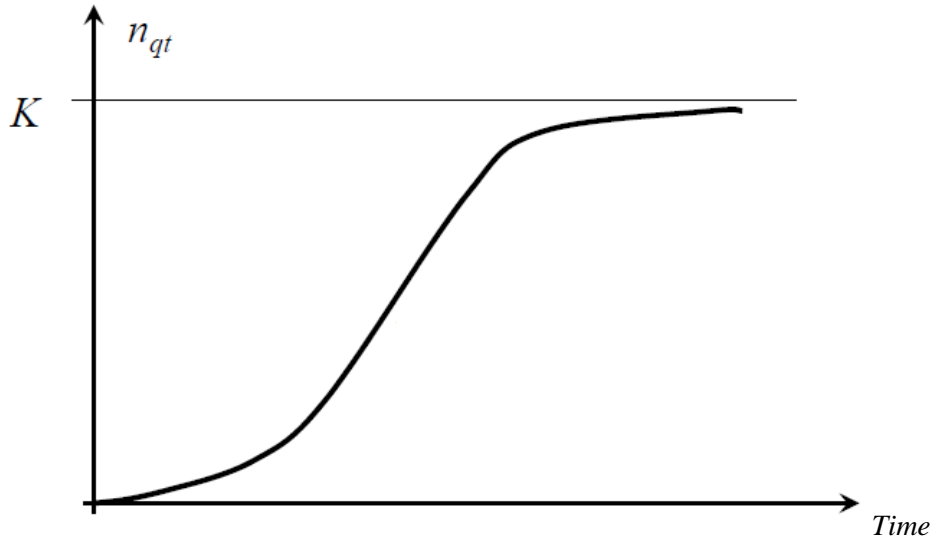
So costs of localization initially decrease up to the point where it reaches an optimal number and then increased due to competition

$$cfq = gfq(wq, rq, dq, tq) + afq(nq)$$

The net benefits of localization are therefore:

$$Nfq = Bfq - cfq = Hfq(wq, rq, dq, tq, kq, lq, sq, uq) + hfq(nq)$$

If you consider a time horizon over which the benefits and costs do not change over time, the geographical difference between a concave function and a convex function is always concave. So every trader who enters the cluster increases the profitability up to a certain threshold, after that point, every new entrant reduces the benefits available to both residents and new entrants. These considerations can be extended to the optimal size of spatial agglomerations of firms, households, etc. there where the benefit functions are concave. So, if the number of firms entering is proportional to the average benefits of localization available in the cluster and the entry rate is proportional to the current level of net benefits of localization is expected that the growth is characterized by a path to a slow start with S (low benefits of locating) a middle period of explosive (high average net benefits) and a final part that stabilizes (balance):



The simplest model that describes the path to **S** is the logistic equation where r_q is the intrinsic growth rate and K_q is the level of equilibrium.

$$\frac{dn_q}{dt} = r_q n_q(t) \left(1 - \frac{n_q(t)}{K_q} \right)$$

Integrating:

$$n_q(t) = \frac{K_q n_q(0) e^{r_q t}}{K_q + n_q(0)(e^{r_q t} - 1)}$$

The *rate of intrinsic growth* r_q is often calculated as the difference between birth rates and mortality of a population.

The *level of equilibrium* K_q represents instead the regional capacity, ie the maximum number of profitable companies that the cluster can sustain in isolation. It depends on the geographical benefits and the negative part of the benefits of agglomeration. In the long term, K_q may change as a result of the influx of skilled workers, new infrastructure, diffusion of innovations (technical, organizational, ...).

The limits of the logistic model to a cluster are characterized by the fact that the choice for an enterprise is exclusively to enter or not into a cluster. However, there are more complex models that emphasize the interactions between clusters: for example, the logistic model to two or more clusters highlights the characteristics of competitiveness clusters for which it is always possible to find a point of balance being the derivatives of functions logistical always linear in nature. In the logistic model can be introduced other complexities that are found in biology, and can be applied to assess the economic effects (employment, income, revenue, etc ...) in diet of competition where N is the population, r their rate of the growth and K the *carrying capacity* or the resources of the environment.

4. THE GREEN FINANCE A PROJECT *CDP ENERGY* IN SCHOOL BUILDINGS

European legislation and international agreements oblige Italy to reduce energy consumption. The goal for Italy established by the Kyoto Protocol (6,5% reduction in CO₂ emissions compared to 1990 levels, to be achieved in the period 2008-2012) and the European Strategy have already identified the objectives for 2020:

- consumption of primary sources reduced by 20% from the forecast trend, through increased efficiency according to the indications of a future directive;
- greenhouse gas emissions, reduced by 20%, according to commitments already undertaken previously, the Kyoto Protocol, ETS (Emission Trading Scheme);
- increase to 20% of the share of renewable sources in the coverage of final consumption (for Italy, the target is 17%).

Among the different areas of intervention, there is great potential for improvement in the civilian sector (currently in Italy absorbs 32% of total energy consumption), especially through energy savings. Energy saving measures on the building heritage of the Municipalities allow to achieve significant results both for the CDP, as a Public Entity that works for the good of the Country, both for the individual Municipalities.

Important objectives for the CDP are:

- The contribution to the achievement of european objectives by Italy in 2020, in order to avoid penalties and reduce the national consumption of fossil fuels, resulting in reduced imports of oil and gas from abroad.

Results important for the Municipalities are:

- A significant reduction in municipal energy expenditure, which brings lasting benefits for years to come after a period of amortization usually very short, especially when working on structures that are very deficient from the point of view of energy (at the same cost of investment, the economic benefit that is achieved with energy saving measures is almost always much higher than that obtainable through investments in renewable sources);
- A redevelopment of its property assets, to be achieved during maintenance operations already programmed and then an additional cost that pays for itself with an increase in value of the property;
- A spreading the culture of energy saving and image return to the Administration.

The model CDP School

Each project of the financing of school buildings involves the following steps:

- **Energy diagnosis pre-intervention (Wp1))**

Intervention is a preliminary energy diagnosis of the building. Before surgery is required **energy certification performed** by an expert certification, which establishes the situation of energy consumption pre-intervention.

- **Interventions on the casing (Wp3)**

It consists mostly of thermal insulation measures of the exterior walls and roof, replacement of windows, solving problems related to thermal bridges.

- **Interventions on the plants (Wp4)**

It is usually carried out on plants of heating (and possibly cooling the building, limited to those areas of the school used in summer). May provide for the replacement of the heat generator, the upgrading of the distribution network of the heat, its fractionation, etc.. The installation of systems with renewable energy sources are provided in this measure only if arising from energy saving measures because the use of renewables is only effective in energy-efficient structures.

- **Control post-intervention**

Downstream of the intervention should be carried out a new energy certification, in order to establish the benefit received and get a possible labeling (plate) to be used also for promotional purposes by the Municipal Administration.

- **Training (WP7)**

The training of the technical staff of the Municipalities is to ensure a proper control and management of the facilities and equipment over time.

- **Continuous monitoring and management**

The concept of continuous monitoring is typical of voluntary certification systems, such as the environmental management system (ISO 14001). It was recently introduced an energy management system (EN 16001), which aims to involve all employees in an organization (including management) in the common goal of saving energy. The municipalities who want to be certified according to EN 16001 will have to implement this system within them.

• Accompanying measures and supervision

This activity will be carried out in order to evaluate the effectiveness of the first pilot projects, make a final report to CDP and possibly make corrections for subsequent interventions.

Economic and financial sustainability

Investimento		wp1	wp2	wp3	wp4	wp5	wp6	wp7	wp8	Totale operazione
€505.000,00		€100.000,00	€150.000,00	€20.000,00	€50.000,00	€15.000,00	€60.000,00	€70.000,00	€40.000,00	
Recupero d'efficienza		25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	
€126.250,00		€25.000,00	€37.500,00	€5.000,00	€12.500,00	€3.750,00	€15.000,00	€17.500,00	€10.000,00	€ 1.893.750,00
25,00%		0,198019802	0,297029703	0,03960396	0,099009901	0,02970297	0,11881188	0,138613861	0,079207921	
timing	15									
tasso d'interesse	4,50%									
rata d'ammortamento	€47.022,47	€9.311,38	€13.967,07	€1.862,28	€4.655,69	€1.396,71	€5.586,83	€6.517,97	€3.724,55	€ 705.337,10
Economia di bilancio	€79.227,53	€15.688,62	€23.532,93	€3.137,72	€7.844,31	€2.353,29	€9.413,17	€10.982,03	€6.275,45	€ 1.188.412,90
Distribuzione Quote di Risparmio										
Risparmio Ente	€63.382,02	€12.550,90	€18.826,34	€2.510,18	€6.275,45	€1.882,63	€7.530,54	€8.785,63	€5.020,36	€ 950.730,32
Spese di certificazione	€ 7.922,75	€1.568,86	€2.353,29	€313,77	€784,43	€235,33	€941,32	€1.098,20	€627,54	€ 118.841,29
Spese d'istruttoria	€ 7.922,75	€1.568,86	€2.353,29	€313,77	€784,43	€235,33	€941,32	€1.098,20	€627,54	€ 118.841,29
Distribuzione Quote finanziarie										
Provista ordinaria	€21.160,11	€4.190,12	€6.285,18	€838,02	€2.095,06	€628,52	€2.514,07	€2.933,08	€1.676,05	€ 317.401,69
Provista straordinaria	€21.160,11	€4.190,12	€6.285,18	€838,02	€2.095,06	€628,52	€2.514,07	€2.933,08	€1.676,05	€ 317.401,69
CDP	€4.702,25	€931,14	€1.396,71	€186,23	€465,57	€139,67	€558,68	€558,68	€372,46	€ 70.533,71

NOTE:

The interventions proposed are referred to a school type of approximately 2,000 square meters and have been explicated in the following way:

- Wp1 (costs covered by the decree of the MISE 22/11/2006);
- Wp3 (it was assumed that the fixtures occupy 20% of the entire structure at an estimated cost of €300.00 per sqm + cost for the insulation of the inner casing for 10.00 €/per sqm + cost for roof insulation at a cost of 10.00 per sqm + and installation);
- Wp4 (standard value which depends on the initial state of the building);
- WP7 (we have assumed a course of 100 hours for the staff Ata and municipal employees).

From the analysis of economic and financial sustainability is highlighted the capability of the pilot model CDP to influence positively on factors such as:

1. Compliance with Kyoto Protocol targets for greenhouse gas reduction activities;
2. Compliance with Lisbon Protocol for technology transfer actions;
3. The improvement in the credit standing of the single financial transaction, through a self-liquidating mechanism generated by the bill savings in energy costs;
4. A significant savings for the local authority which generates economies of the balance sheet net of the costs related to the implementation of energy efficiency measures (installment loan + certification expenses + costs of investigation);
5. The Economics of the balance sheet net of expenses related to the implementation of interventions, expected by the Local Entity in the 15-year of amortization, are amounted to about 50% of the total value of the investments required to carry out such operations;
6. The replicability of a single operation on all school buildings of the Municipal Entity, recipient of the funding CDP;
7. The relevance of the net budget savings that the Municipal Entity (medium-sized) could generate, the assumption of render efficient at least 10 school buildings;
8. The average size of requests expected from medium-sized Municipalities is estimated at around 5 M €, absolutely in line with the potential supply of CDP;
9. The net budgetary savings expected from medium-sized Municipalities in the 15 years covered by the depreciation (approximately 2.5 M €) will have the ability to improve the credit quality of Local Authorities entrusted.
10. The structural nature of the instrument *CDP Energy* that would allow to the Local Authority to finance (with annual cost savings in the bill) all services ex-ante and ex-post the implementation of interventions, moreover these are very functional in ensuring long-term the sustainability of the initiative.
11. The possibility of extending the model CDP Energy to the areas covered by the MISE Ministerial Decree of 22/12/2006:

Schools Public

Water Systems

Lighting Public

Public Buildings or public use

Buildings for residential use

Hospitals, clinics, nursing home

5. IMPACT OF GREEN FINANCE ON THE NATIONAL PUBLIC DEBT

From the analysis of CDP data and the pilot project in the field of school construction, an efficiency gain of 25% can result in significant budget savings and an increase in the credit rating by the Local Authorities. Assuming that the rates of increase in the market shares of CDP, which is estimated projection data bank of Italy (see page 3) can express the parameter r (growth rate) of new potential customers, the ratio of total Public Entities and Organizations Customers (Great Public Entities + Public Entities), the parameter k (carrying capacity) and the segmentation of the application as numerical value N of the population of organizations, the simulations through the logistic function generates the following results for the next 10 years:

STRUCTURE OF THE MARKET	Absolute values		values %	2010	2015	2020
GREAT PUBLIC ENTITIES	163		1,98%	163	163	163
Regions and Aut. Prov.		21				
Provinces		62				
Chief town		66				
Not Chief town		14				
PUBLIC ENTITIES	5319		64,65%	5319	5319	5319
Regions and Aut. Prov.		0				
Provinces		33				
Chief town		32				
Not Chief town		5254				
NEW COSTOMERS		0		112	634	1083
MORE POTENTIAL CUSTOMERS	2745		33,37%	2633	2111	1662
Regions and Aut. Prov.		0				
Provinces		8				
Municipalities		2737				
Total	8227		100%	8227	8227	8227

Projected new customers of the CDP - years 2010 - 2015 - 2020

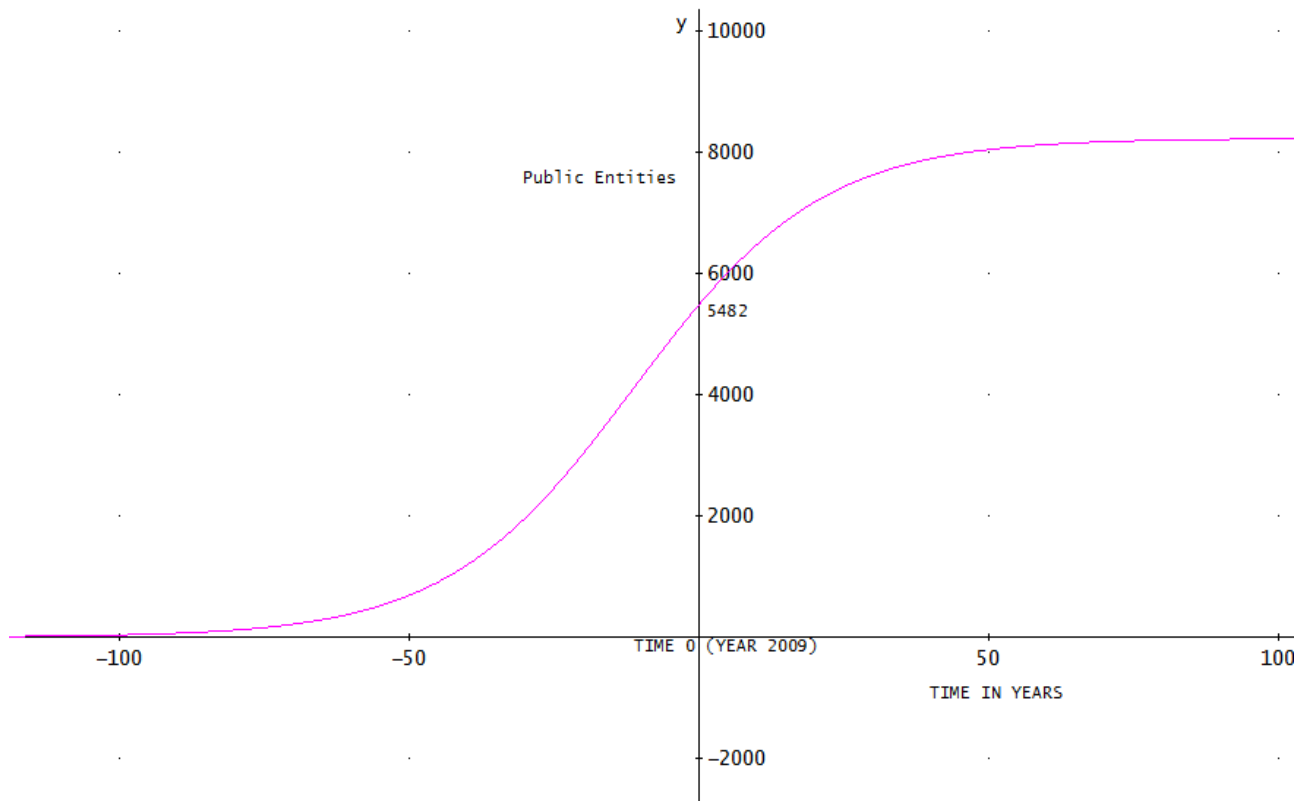
The above table contains the projection of the new customers of CDP during the period analyzed. The first prediction is 0 to 1 year from the time 0 (year 2009) and the other two at 5 and 10 years after the first projection.

Below is the calculation of the parameter r of the logistic function which is equal to the geometric average of the annual rates of increase in the market shares of CDP.

Parameter r (growth rate)	2006	2007	2008	2009
Market shares of CDP	36,20%	37,90%	40,90%	43,48%
		4,70%	7,92%	6,31%
Geometric Average of Annual Rates				6,17%

Calculating the Rate of Growth r

The parameter k is equal to **1.50073** ($= 5482/8227$) while N is the population at time 0 (year 2009), equal to **5482** Public Entities (see page 3).



The logistic function, which produced the graph above, is as follows:

$$n_{CDP}(t) = \frac{8227 \cdot 5482 \cdot e^{0.0617 \cdot t}}{8227 + 5482 \cdot (e^{0.0617 \cdot t} - 1)}$$

Thanks to new customers expected, also the market shares, which measure the intensity of the mission of the CDP, will increase. The expected data according to the logistic model that we used are the following:

Years	2010	2015	2020
Market shares of CDP	44,37	48,48	52,03

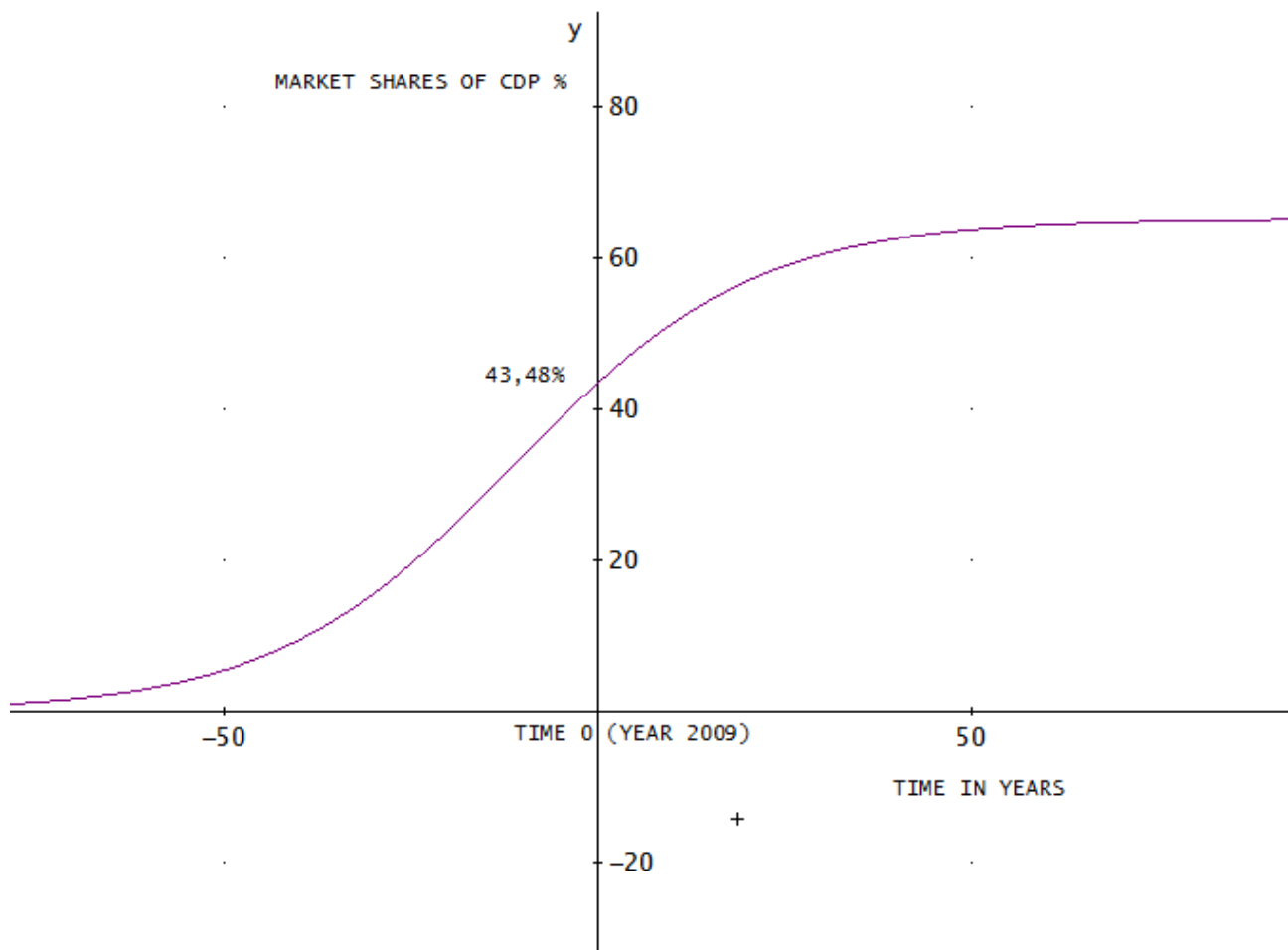
Projection of the market shares CDP - years 2010/2015/2020

Our forecasting model foresees an increase of 19.66% of the market shares of CDP with reference to 2020 compared to 2009.

The logistic function used for the projections shown above is the following:

$$n_{CDP}(t) = \frac{43.48 \cdot 1.50073 \cdot 43.48 \cdot e^{0.0617 \cdot t}}{43.48 \cdot 1.50073 + 43.48 \cdot (e^{0.0617 \cdot t} - 1)}$$

The graph of the logistic function built for market shares is as follows:



The construction of the logistic function is based on the assumption that the market share of CDP produced by the public entities served by CDP is proportional to the number of new institutions served in various years considered in the simulation. Therefore, with reference to the year 2009 (which is the year 0 of the logistic model) against a number of customers of 66.63% (5482 out of 8227) the market share achieved CDP was equal to 43.48%. The difference between the percentages is due to the fact that Public Entities work with multiple lenders, resulting in different volumes by type of authority, therefore the market share is less than that of customers served.



6. CONCLUSIONS

As demonstrated by the studies and calculations performed in the present work, the intensity of the mission of the CDP model in Italy can be expressed by the market shares of CDP on the financing of public debt. Also, as shown in the model CDP Energy, the green finance, creating obvious budgetary savings, could have a leading role in the improvement in the credit standing of local authorities. So these institutions will have easier access to funding activated by CDP, helping to increase of the 19.66% the market shares of CDP in the next 10 years.

ABSTRACT

The Energy Service Company (ESCO also called) are companies which carry out actions to improve energy efficiency, taking upon himself the risk of the initiative and freeing the end user from any organizational effort and investment. The economic savings obtained are shared between the ESCO and the final customer with different types of trade agreement. Usually the intervention methodology is divided into the stages of "Energy Diagnosis" designed to identify waste, inefficiency and misuse that produces the elements to prepare a rough draft of the measures to be implemented and the management and maintenance of the plants to all over the agreed period. The idea of supporting the implementation of energy saving policies in protecting the environment, in line with the procedure provided for by Agenda 21 and in full respect of virtuous actions to reduce costs in the delivery of public services, is framed in the management separate Deposits and Loans in Italy finances about 40% of the national debt. This type of action, capable of ensuring budgetary savings through the introduction of technology (eg LED, photovoltaic, thermal, wind, etc ...) to cover obligations necessary for the realization of the investment, expresses a significant market whose size could already in first instance be estimated from the analysis of the consolidated entity, the analysis of georeferenced maps (GIS) and satellite data (SAR) today normally available to the local authority and national agencies in order to estimate with sufficient accuracy the potential of renewable energy actually achievable in "public areas" from sources such as wind, offshore wind, hydro, mini-water, photovoltaic, thermal.

The research team, after estimating the demand for debt financing that the CDP model is now able to meet, analyze the impact of this model may have on the budgets of local authorities both in terms of improvement in the credit standing of local authority, both in terms of reducing the cost of management of major public infrastructure through the construction of an indicator of the intensity of the mission which the financial instruments could be compared to the classic green finance support to local authorities expressed today by the system the nation's credit.

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