

# INCINERATION OF MUNICIPAL WASTE - NEW INVESTMENTS FOR DEVELOPING COUNTRIES OR CHALLENGES OF THE ECOLOGICALLY DIRTY TECHNOLOGIES

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**Abstract**—The aim of this paper is to underline the close relationship between the need for rapid economic development, the need for foreign investment in the public sector and the challenges of rapid acceptance of such initiatives in terms of environmental protection and sustainable development at the time when the export and import of dirty technology is being offered. The necessary change in the structure of service providers in terms of impact on the quality and price of services from the aspect of legal possibilities of a new way of regulating relations between citizens as service users, state (local government) and providers of services-products. The basic assumption is that there is no economic environment that will encourage the entrepreneurial spirit, investments and better services for citizens without a comprehensive public sector reform and changes in property relations. With this paper, we would particularly like to draw attention to the possibility of finding a solution that will connect reform activities in the field of public institutions and services through public-private partnerships, but with the necessary and required permanent care for the protection from the challenges of technologically dirty technology.

**Keywords**—Foreign investment, public sector, public-private partnerships, communal services, technologically dirty technology.

## I. INTRODUCTION

INCREASING the competitiveness of services in the private and public sectors should be sought within the modern development model in the framework of Serbian legislation. Change of the current model of privatization under the provisions of the Law on Privatization from 2001 is necessary, given the changed circumstances in which the state, society and services (public sector) found themselves after the outbreak of the economic crisis, with all the weaknesses demonstrated by privatization of the existing model, and large political and professional disagreements on models and principles of public sector privatization. On the other hand, the state will find it progressively harder to pay off current liabilities in public services, and there will be no resources for the procurement of new equipment and

investment; social tensions will be more widespread, the economy increasingly burdened, and state funds running low. What measures can be taken by entities in health care to assist health care itself? The only possible answer is – the public sector reform, as well as the reform of health care as its significant part, is possible through new models of public-private partnership.

The public sector has significant influence on the overall operations of the Serbian economy. The health care sector, as a social sector in Serbia, now has a monopoly position. All of the above have an impact on the overall cost of health care institutions and, on a larger scale, the standard of living. Through its low efficiency and high cost of health care system costs, public (government) sector transfers the negative impact through relatively higher prices for their services to the entire state budget [1].

Keeping the public sector at the current level of efficiency and the status of property will undermine the effects of privatization of the social sector, as well as the development and competitiveness of the private sector. Hence, the privatization of the public sector in health care is the condition for the successful privatization as a whole, but, most importantly, for the quality of health services. Privatization is not over until the public sector is privatized. With the privatization of the public sector, the conditions will be met for a successful and comprehensive transition to a market economy in all areas where it is possible. The end result should be a cheaper and more efficient government, and a much better health care system, by improving competitiveness as one of the basic principles [1].

## II. THE CURRENT SITUATION IN THE PUBLIC SECTOR AND ITS COMPETITIVENESS

The public sector and health care will not be able to meet the development needs of the society in the future, both in terms of quality of services and their size and type. Continuous use of funds, the need for higher wages regardless of the flow of funds, rapid obsolescence of

equipment and other resources, and the lack of funds for development inevitably lead to a state that will threaten the basic functions and the existence of the field [2]. In addition, the permanent removal of irrationality and inefficiency in the sector is not possible without privatization. With the privatization of the public sector, the efficiency of health care will increase, but also the efficiency of the entire field. The integration process toward the EU includes the involvement of the public sector, particularly large clinical centers, and their privatization, at least in certain segments, is a prerequisite for participation in this process and successfully staying in it [2]. It is necessary to start the process of health care restructuring and accelerate it through several steps:

- 1) *Separation of business that can go on the market from the core business in which state funds will be a preferred form of financing, and which had a negative impact on total costs.*
- 2) *Rationalization of the number of employees, along with appropriate social programs funded by the budget of Serbia.*
- 3) *Financial restructuring and consolidation, as a condition for financial stabilization, improving financial structures of institutions and providing room for bigger investments in development and modernization. It should not be expected that the technical and technological restructuring will be completed from its own resources. This requires huge resources that cannot be provided by the current performance of the faltering economy, and neither by the budget of the Republic of Serbia or the budget of local governments.*
- 4) *Defining fees for services individually.*

In the public sector, particularly health care, we have illogical phenomena that do not occur in the economy with private capital. Total number of employees increases, because the numbers of patients and services users increase even when the production does not increase, therefore, the revenues in the funds are not growing. The only real barrier to such irrational behavior is privatization and the existence of private property in this sector. Administrative control of public sector wages always falters under the pressure of compromise in politics, at the expense of quality improvement and acquisition of new equipment, which means development.

Due to the lack of proprietary motivation in health care, there are constant pressures on wage growth and they occasionally escalate into general demands supported by all employees in health care.

With the existing level of efficiency, health care in Serbia is unable to participate in the integration process of the EU, or to withstand the pressure of foreign competition on local health care (contracting health services in Turkey, Austria, etc.) [3].

### III. THE LEGAL FRAMEWORK FOR THE ESTABLISHMENT OF PUBLIC-PRIVATE PARTNERSHIP IN THE REPUBLIC OF SERBIA

Due to its great importance, complexity and number of

participants in PPP projects, in 2003 the European Commission adopted the "Guidelines for Successful Public-Private Partnerships", and in 2004 "Green Paper on Public-Private Partnerships" and Community Law on Public Contracts and Concessions.

Based on these guidelines, the states of the EU have created its own legal framework for PPP, which usually consists of the laws on PPPs, concessions and public procurement and their by-laws.

Local authorities in Serbia can contract PPP projects in accordance with the provisions of several laws regulating the private partner choice, the establishment of public-private partnership, the award of public contracts and delegating the performance of its tasks to the legal or physical entity.

The Law on Public Services (1997): The local government may assign performance of an activity of public interest and optional activities through procurements by contracting PPP projects for: cleanliness, greenery, transportation, streets, cemeteries, parking, markets, rendering plants, etc.

The Law on Public Services (2011): The local authority may delegate the exercise of public utilities to an entrepreneur or other business entity, guided by the principles of competition, cost-efficiency, efficiency and environmental protection [6].

The Public Procurement Law was adopted by the National Assembly of the Republic of Serbia on 29 December 2012, entering into force on 06 January 2013, and whose application is foreseen for 01 April 2013. The local authority is obliged to, by implementing the procedures and principles of public procurement, choose a private partner for the conclusion of a public contract without the elements of concession for the purpose of design, construction, use of public facilities and/or provision of services under the public private partnership.

Law on public Private Partnership and Concessions (2011): The local authority has the right to self-initiate the implementation of PPP projects with elements of the concession or excluding them and conclude a public contract with a legal or physical entity to carry out their responsibilities.

Law on public Private Partnership and Concessions defines the conditions and manner of preparing, proposing and approving the projects of public-private partnerships; define entities and their responsibilities, that is the authorizations for the proposal and implementation of public-private partnerships' projects; the form and the content of contracts on public-private partnership with or without the elements of concession and legal protection in the award of public contracts; the conditions and procedures of granting the concession; the subjects of the concession; the subjects entitled or authorized by the concession granting procedure; termination of the concession; protection of the rights of participants in the award of public contracts; establishment, status and powers of Commissions of public-private partnerships, as well as other issues of

importance to public-private partnerships, with or without the elements of concession, that is for concession [7].

The principles according to which the procedure and the conclusion of a public-private partnership contract must be carried out should be particularly emphasized, as follows: the principle of protecting the public interest, which includes the obligation of public bodies at the exercise of the right of private persons to take into account that the realization of these rights is not contrary to the statutory public interest, the principle of efficiency includes the obligation that the process of the conclusion of the public contract and the selection of the private partner is implemented under the terms and in manner prescribed by the law on public-private partnership and concessions and the Public Procurement Law governing public procurement, with as little cost to the proceedings, the principle of transparency includes the duty of advertising the intent on the conclusion of the public contract, with or without the elements of concession, the possibility of the bidder to inspect the data on the conducted procedure of awarding public contracts, the principle of equal and fair treatment, including the prohibition of discrimination on any ground among participants in the award of public contracts and the selection of the private partner, as well as the obligation that the participants in the selection of the private partner have full and accurate information about the procedure, standards and criteria for the selection of the private partner, in the selection of the private partner none of the participants can have the advantage over the others in terms of time, information and access to the agencies and individuals responsible for the process of awarding public contracts [3].

Decisions have to be made on the basis of previously published and objective criteria, and have to be submitted with the explanation to each participant in the procedure of selection, the principle of free market competition encompasses a prohibition of limiting the match between participants and the obligation of accepting all participants with adequate technical, financial and other professional qualifications, the principle of proportionality means that any measure taken by a public authority, or other person, shall be the minimum necessary and proportionate to the public interest which seeks to be protected by such a measure, the principle of protection of the environmental protection includes the principles defined in the law governing the protection of the environment, such as: the principle of integrality, the principle of prevention and precaution, the principle of conservation of natural values, sustainable development, the principle of polluters' responsibility, the principle of autonomy of will including the freedom of the parties to comply with this law, the law governing obligations and other regulations and good business practices, mutual rights and duties arranged at will, the principle of equality of the parties, implying that the mutual relations of the subjects of the public contract are based on their

equality and equality of their wills,

Legal professionals have a key role in the preparation of agreements on public private partnership. They help local authorities in the process of negotiating of PPP agreements to recognize the implications, particularly provisions that regulate the protection of the public interest by: property rights, compensation, termination, dispute resolution, etc. Their role in project teams is:

- 1) *insight into the structure and drafting of tender documents, PPP contracts and leases of land,*
- 2) *providing legal advice in the selection of the private partner and*
- 3) *legal advice in relation to taxation, property, planning, environmental protection, finance, competition and protection of intellectual property.*

It should be noted that the public-private partnership project is considered the project that is drafted, proposed, approved and implemented by some of the public-private partnership model and is a series of interconnected activities that take place in a certain order, to achieve the goals defined within a certain period of time and certain financial resources, which is in accordance with the law approved as a project of public-private partnerships, with or without the elements of concession. After that, it is entered into contractual public-private partnership in which the relationship between public and private partners is regulated by a public-private partnership contract. Public contract is the contract on public-private partnership, with or without the elements of concession, concluded in writing between the public and private partners, or public or private partner and a special purpose society, by which in the aim of the realization of public-private partnerships project, mutual rights and obligations of the parties are regulated.

A special role is played by the public body which is a public authority, organization, institution and other direct or indirect beneficiary of the budget in terms of the law regulating the budget system and budget, as well as by organization for mandatory social insurance, which may be a public company, a legal entity exercising also the activities of common interest.

The professional assistance in the implementation of public-private partnerships projects and concessions in accordance with this law is performed by the Commission for a public-private partnership established by the Government on the proposal of the Prime Minister, the Ministry in charge of Economy and Regional Development, the Ministry responsible for finance; the ministry responsible for infrastructure, the ministry responsible for mining, the ministry responsible for public utilities, the ministry responsible for environmental protection, of the autonomous province and the city of Belgrade. A representative of the Ministry in charge of Economy and Regional Development is also the President of the Commission, and the representative of the Ministry responsible for Finance is Deputy

Chairman of the Commission. The Commission consists of nine members. For the Commission member a citizen of the Republic of Serbia may be nominated, which has at least a high level of education and the necessary expertise in the field of public-private partnerships, public procurement and concessions, or the rights of the European Union [7].

#### IV. MUNICIPAL WASTE INCINERATORS - A CHANCE FOR NEW INVESTMENT OR TRANSFER OF DIRTY TECHNOLOGIES INTO SERBIA

The end of the twentieth century is characterized by restructuring of economic and production capacities at the global level of international trade, with a tendency to continue also at the beginning of the twenty first century where classical forms of international trade are abandoned, such as traditional exports and imports of goods, where the international production of transnational companies comes to the public scene.

The processes of globalization, international regional integration and development of international trade have influenced on developing countries to enact liberal legislation in the area of foreign investment in order to stimulate foreign investment in the national economy. Decisions about foreign investments have increasingly been made at the local level as a result of liberalization in economic policy.

According to the economic power of transnational companies that place their investments in developing countries, in addition to creating the conditions for increasing the number of employees from local communities, building new infrastructure, overall economic growth, multinational companies could also cause certain problems in developing countries.

Many countries, including Serbia, meet the aggressive performance of foreign companies and in their investments there is no place for sustainable development-preservation of a healthy environment. The main reason is the outdated old technology. Special examples of such investments are offers from the field of municipal waste management through the construction of a waste incinerator.

Construction of incinerators for municipal waste is one of the possible ways of waste management and has begun in the second half of the twentieth century, especially in developed countries such as Sweden, Canada, USA, Japan. The largest number of these incinerators and the whole plants is closed, and in these countries their further construction is being suspended. The main reason for the incinerator closure is a great toxicity and hazard on human health and the natural environment, primarily because the successful maintenance is highly expensive. This claim is, for example, confirmed by the fact that changing the filter on the hazardous waste incinerator in Vienna, costs Euro 30 million [5].

In accordance with the approved Waste Management Strategy it is indicated that the investment and operating costs of incineration, according to the EU regulations are high and so much higher than the cost of waste disposal

in sanitary landfills. Electricity generated by burning waste is more expensive than energy from burning coal.

"Ecologists have found that the ash and smoke emitted by incinerators are the largest source of dioxin and other hazardous substances that cause cancer and pollute the environment. Dioxins cause a variety of health problems, including cancer, damage to the immune system, developmental and reproduction problems. Furthermore, through the food chain they are transmitted to humans, animals and plants. Besides dioxin the incinerators also emit lead, heavy metals, cadmium, arsenic, chromium. The consequences of such emissions are acid rains. A particular problem is the ash that remains after burning and is a carcinogen, and therefore it does not make sense to locate the incinerator in the area of food production as the environment and food chain can be contaminated by means of air and water." [5]

Numerous studies have shown that there are no safe incinerators and that they are all equally dangerous, both those that burn hazardous waste, and those that burn municipal waste, and they have no place in sustainable development and in the future.

Methodology of winning the markets and new countries is always identical, according to the methods the investors themselves elaborated in detail.

The first phase consists of making professional, allegedly scientific studies financed from donors with the aim of monitoring the proper management of municipal waste. Such studies in many local communities are already funded and based on its own and local forces are developed by the professional teams of young assistants funded by USAID Serbia from the American people or by GIZ (German donor).

It is all continued by the procedure by which a foreign company wants to do good for the local authorities and the local population by the large foreign investment while preserving the environment with the best solutions for clean technologies, and by engaging its own resources and the resources of the local community is finds the right and only solution in the construction of incinerators and where additionally electrical energy is produced - "green" electricity, without which we will not be accepted as a member by the European Union.

The next stage is a tourist trip for local and government officials but also for the officials in developed countries where incinerators operate for decades and the charity of the developed will allow to a developing country to obtain this miracle of technology and the preservation of their environment. With accommodation in luxury hotels and a longer study period typically follow foreign wages as well. As a rule, "the tourists-officials" are delighted with what they saw.

The local community follows the promotion wholeheartedly lead by the local administration and management, along with explanations to hire local labor, most construction companies and new jobs, as opposed to the real interests of their own citizens who only then start with demonstrations precisely due to the reasonable fear brought to them by a possible disease.

Foreign partners always offer typical contracts, which are accepted in "all over the developed world"

Known as "put or pay" contracts, this would mean contracts with the legal rule "deliver waste or pay" with the following characteristics:

- a) The Parties are one or more local municipalities-cities, and on the other side are the foreign investors provided that the investment is paid only if the contract is a long-termed of twenty to thirty years.
- b) the subject of contract is building of waste incinerators, which also produces electricity, and the fuel is municipal waste.
- c) In general a foreign investor provides the building an incinerator with a value of 150-200 million euros, which represents its share in the joint venture to 49 %, and the municipality-city provides land and infrastructure, which makes 51 % share, by which it remains the majority shareholder in division of the expected large gain from the sale of electricity, according to its share.
- d) Given the size of the municipality-town and several local neighboring municipalities with which it is being entered into the contract, it is negotiated that the public utility founded by local communities to delivers a minimum annual quantity of municipal waste of 300,000 tons. Under the contract the municipality-city is committed to pay 50 euros for the incineration service per ton of waste delivered.
- e) The competent ministry is always included and the state-owned company engaged in the production and distribution of electricity, which guarantees that it will buy and include in its distribution system the sale of "green power" which is paid for more expensive than "ordinary" electricity.
- f) In order that foreign investors have confidence in all the work and investment in terms of incinerators' capacity, the safe delivery of a certain amount of waste is contracted, and as a security for the performance of work the local community, the municipality-town appears as a guarantee for the delivery of planned and projected waste volume at a strictly fixed price for which promissory notes or bank guarantees are issued. Therefore, if municipalities-cities do not deliver a certain amount of waste they required to pay the cost of the plants not operating at full capacity because the municipality-city assumes all losses.

Thus, municipality-city put themselves a noose around the neck as the agreed projected amount of municipal waste can not be delivered and activation of bills and bank guarantees is then performed.

Experience has shown that as a rule, after the first year of exploitation a problem arises from insufficient amount of waste and the cost of plant downtime have to be paid.

There is a general appearance of the impending bankruptcy of the local budgets of municipalities-cities which have lusted and easily made an agreement with the clause "put-or-pay" because they could not deliver the projected and agreed quantity of waste. As bankruptcy of local governments is not possible the bill is paid by the citizens through enormously determined increased liabilities for municipal waste collection.

In the whole story the foreign investors is the only one who provided for the investment and expected incomes, because there it always has an excuse, I give the money, so ask for guarantees, even when it does not work, he gets penalty money from the municipal center.

There are a large number of municipalities-cities that are visited by the foreign delegations, and a number of them have even concluded Protocols on cooperation defining the rules of future contracts. The continuation of such visits and "study tours" is continued by the attempts from Sweden, Switzerland, the Czech Republic.

These facts do not mean an attempt to stop the inevitable process of privatization of the utilities sector and public-private partnership is practically the most cost-effective and fastest way of placement of available funds from private sources in the communal area but always with the remark and the necessary attention that sustainable development and the preservation of a healthy environment is the priority of any government.

Social needs for minimizing the impact and high efficiency in waste incineration has been growing recently from the standpoint of even more minimizing the impact to the environment and advancement of thermal recycling. Kawasaki Plant Systems, Ltd. meets the various needs by developing Kawasaki Advanced Stoker-type Incinerator, which has been highly developed from Stoker-type Incinerator with its credibility supported by reputation of long standing and by developing gasification and melting system, which enables to utilize the combustible gas generated by gasifying the waste for melting process. Kawasaki has delivered waste incineration facilities these systems as flue gas processing systems and has developed various systems and technologies in order to return the clean air to the environment after eliminating pollutants contained in the gas from incinerator such as hydrogen chloride (HCl), sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>). Through its extensive experience, Kawasaki provides flue gas processing system fitted to many plants as well as waste combustion system (figure 1) [8].

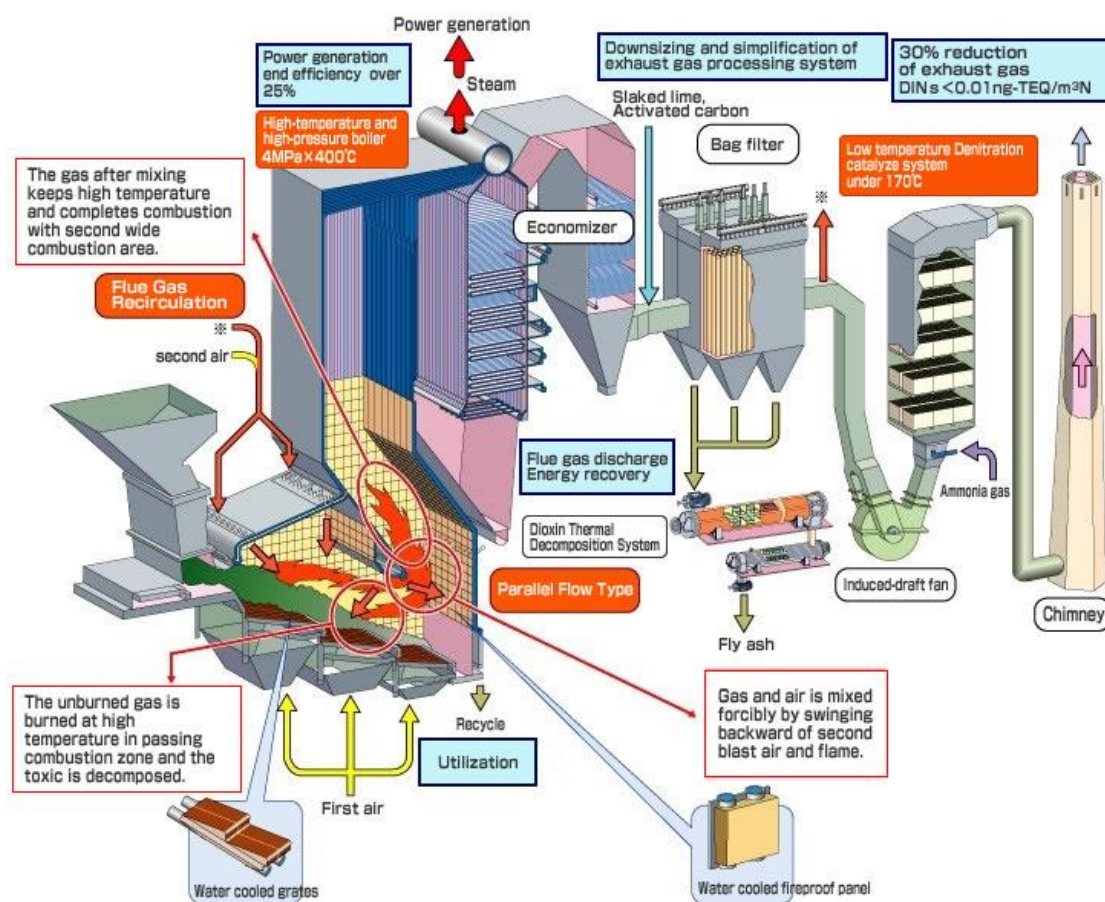


Fig. 1. Incineration (Heat recovery) Plant - Advanced Stoker System

## V. CONCLUSION

Faster economic growth in reduced investment capacities of national economic entities is only possible with participation of foreign investors whose involvement is inevitable. New forms of economic and financial connections require the creation of new legal, social and economic forms that will find a way in “the forest” of regulations towards all parties whose interests need to be united. Necessary reform of the public sector and services is not only imperative of the current political and party goals, but a strategic issue for further development in this area. It is clear that there is no new economic environment that will encourage the entrepreneurial spirit of investment and better services for citizens without a comprehensive public sector reform and changes in property relations. The contracts on public-private partnerships that are based on the Law on Public-Private partnership and concessions are one of the most realistic legal frameworks and the assumption of fast, efficient and lasting solutions.

Communal field in Serbia is followed by a series of misfortunes, particularly the lack of funds preventing the purchase of new utility resources and equipment which in turn results in a lack of quality service to the citizens, and therefore the expensive service. The inevitability of

public sector reform is conditioned by the adequate reforming.

Any future investments in public utilities, such as processed recycling municipal waste plants or construction of landfills and incinerators, if built, should be located in industrial areas, which are located separately, outside of the inhabitants with all the measures to control potential consequences and permanent monitoring and protection in order to maintain sustainable development.

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