

# Innovative waste management by means of business model Public-private partnership

Krasimir Nikolov

**Abstract:** Increase of the manufacturing capacity in European Union (EU) depends on scarcity of resources. The competitiveness of manufacturing business is directly connected to effectiveness of waste management business. Business partnerships are main strategic element in the realisation of successful and gainful companies. Not all companies work on high level of productivity and effectiveness. So, the crowdfunding strategy gives the company's opportunity to be funded by the community.

The great challenge is solving the contamination problem and manufacturing effectiveness in Bulgaria and in EU. That could be done by the creation of business connection between public and private sector.

Innovations in waste management business are more important than ever, the new principle community-to-community gives an opportunity for development of partnership between the public and private sector, as well as the community.

**Key words:** waste management, public-private partnership, company and community.

Our community is faced in front of pollution and with the manufacturing business effectiveness problem. In modernity vision of the waste management business, it can effectively underpin the manufacturing SMEs. We know that wastes possess values and they could be returned into economy. In sum this is circular economy [1]. Business model PPP is an instrument for<sup>1</sup> providing the highest quality public services. The waste management process is well known in energy projects, by incineration process. But waste recycling process is very important for the SMEs.

In connection to the issued Order by the Ministry of Environment and Water [2] is prepared mathematical analyses, including four Bulgarian JSC. The companies treat packages of wastes from plastic, paper and cardboard, glass, metal, wood, and compost.

**Table 1.** Waste management companies in Bulgaria

Company	Packages placed on a market	Recycled waste packages	Recycle level
Bulkopack	44 841,88 (13%)	29 257,70 (14%)	65,25%
Ecocollect	52 835,85 (16%)	32 513,18 (15%)	61,54%
Ecobulpack	93 312,41 (28%)	62 822,35 (30%)	67,32%
Ecopack	142 680,01 (43%)	87 144,07 (41%)	61,08%
Sum	333 670,15	211 737,30	

Source: Ministry of environment and water, Bulgaria

From the tabulated information we can see that "Bulecopack" JSC holds the lowest packages recycling level, hence this leads to the lowest competitive level and market share. For addressing this kind of problem, it is possible to be treated more different kinds of wastes such as: out of order equipment, clothes, shoes, rubber, and the like. In

all Member States in EU, waste recycling business should be expanded on a maximum possible level. That would happen by inclusion of the manufacturing SMEs, community and waste management business in the circular economy.

In accordance to the National Statistical Institute of Bulgaria the waste treatment level is about 30%, therefore 70% of them fall into landfills. There are great omission between waste recycling strategy in Bulgaria and the leading MS one. What we need? The recycling community [3] provides added value to the community, by environmentally maintained living areas, low price level of recycled products and increasing the competitiveness of the manufacturing and waste management companies. In Bulgaria, in 2003 was enacted Waste management Act. In 2012 was issued Public-private partnership Act and in 2013 was enacted the Waste management National plan 2014-2020. In the Plan are noted the possibilities for inclusion of the PPP in waste management business. Consequently, this is a great opportunity for the development of the "Bulecopack" JSC.

## Creation of the organizational mechanism PPP

The author of the scholar paper is researched the possibility for acquiring "Bulecopack" JSC by the manufacturing SMEs, by building up of the innovative PPP model which includes private prosperity, creation of Special Purpose Vehicle (SPV), and building up of the principal *community-to-community*.

### *Theoretic – scientifically realization of the organizational mechanism PPP*

Step 1. Creation of the innovative business model BLoOOM (Build-operational Leasing-Own-Operation-Management) based on PPP. For the establishment of the model many literature sources have been analyzed [4], [5], [6].

*The wording* – new PPP model aims to create a greater market share for "Bulecopack" JSC, following the next steps:

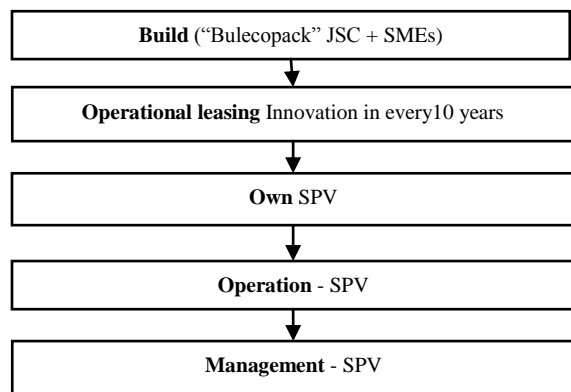
Build – construction of the new build for treatment of a greater volume wastes, not only packages wastes. The process is being fulfilled by Special Purpose Vehicle, which is created in stage 3.

Operational leasing – this is an opportunity for buying a new one equipment for waste treatment process, in every ten years.

Operation – treating of the separate waste collection from the households and its processing for the manufacturing purpose and third parties.

Own – the SPV is 100% owner of the waste management business and is not possible to be transferred to the public partner at the end of the contract duration.

Management – supplying of the manufacturing SMEs with recycled resources, as well as the processes of incineration, composting, reuse and business with third parties.



**Figure 1.** New PPP business model BLoOOM

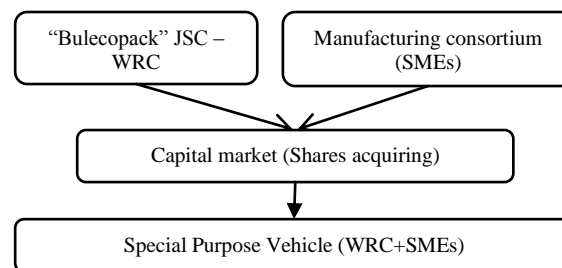
*Source: Author of the article*

*Step 2: Applicability test of the SPV*

- High prosperity of the SPV, based on the partnership between manufacturing SMEs and “Bulecopak” JSC;
- Long contract duration with the public party, 30 years;
- Assuming of all risks – construction, exploitation, management of the waste treatment, demand of services, risk availability, market risk with third parties;
- Long perspectives, expenditures assessment, analyses of the trade and ecological forecasts.

*Step 3: Creation of the SPV*

For the phenomena realization is assumed that “Bulecopack” JSC is acquired by the manufacturing SMEs, consequently it is a financial strategy between two private partners. In the SPV every one SMEs is a shareholder. The public sector is introduced by the municipal unit, which is the owner of the land for disposal of the separate waste collection systems. In the SPV are included associated partners: innovation center and technical university. In this way the value chain is changed by the inclusion of the recycled resources at lower prices in comparison to the supplier’s prices and resources extracted from the nature. In addition, the business synergy (shown in step 4) comes from the trade activities with third parties and the additional profit could be realized from lower prime costs of the resources which come from the manufacturing business of the SMEs.



**Figure 2.** Share acquiring process by the manufacturing companies

*Sources: the article’s authors*

*Analyses of the provisions concerning competitiveness between undertakings.*

In the research is assessed the new PPP business model – BLoOOM on a legislative level by applying the Treaty on the Functioning of the EU (TFEU). As it is noted by the European commission, EU markets should work better ensuring that all companies compete equally and fairly on their merits. Hence, the benefits are for the consumers, businesses and the European economy as a whole. In sum, the new PPP business model in the waste management business could be compatible with the internal market [7], because of the fact that prevention, distortion and restriction would not be impaired. In a detail, regarding to the Treaty of functioning on EU, article 101 will not be infringed because the SMEs included in new PPP business model origin from different manufacturing sectors and the creation of cartel will not be possible. The case is the same with article 102, hence it will not be infringed because SMEs in the waste management factory do not have a dominant market share. In fact the SPV will gain an additional profit by selling the recycled products on third parties. But the main business activity will be use of the recycled products in the manufacturing process at lower prices in comparison with the supplier prices. This is a backward integration in the sense of Igor Ansoff’s matrix. The cooperation between SMEs would not limit the production and innovation process, because of the inclusion of the innovation center and a university in the effectiveness improvement of the recycling equipment and facilities. Likewise, the responsibility to SMEs could be enhanced by applying Think Small First Act. [8]

The process of concentration between SMEs is analyzed in accordance to the specification of the new PPP business model - BLoOOM. In the current article is researched the Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (the EC Merger Regulation). The principle of an open market economy with a free competition must be maintained on a MS level. In accordance to the new PPP business model – BLoOOM, the competitiveness of European industry will be increased, the conditions of growth will be improved and standard of living in the Community will be raised by supporting the level of the recycling society. New PPP model could not

be an impediment for an effective competition because SMEs in SPV do not have a dominant position on the Internal European Market.

In the research it is accepted that SMEs included in new PPP business model fall in article 1 – titled *Scope*, from the Regulation (EC) No 139/2004. In article 2 – titled *Appraisal of concentration*, of the Regulation, new PPP business model does not create an impediment for competitors to enter in the recycling business. And dominant position of the PPP model is not applicable. SMEs are independent in doing the business on a manufacturing level. Regarding article 3 – titled *Definition of concentration*, the new PPP business model - BLoOOM is created by the concentration of the SMEs. SMEs are independent in their manufacturing business, but the process of waste recycling is a common business activity. In accordance with article 5 – titled *Calculation of turnover*, concentrated SMEs included in new PPP business model do not sell the recycled products between them or provision of services, because the recycled products will be used in line to the different specification of the SMEs.

The new PPP model provides a chance to SMEs to fulfill environmental changes by applying the waste management business strategy. In detail, they will create more European added value by increasing the capacity for new "green" markets and energy efficiency. This is supposed to be a new environment management system in SMEs business. By applying the new business modes SMEs will enhance the competitive advantages in comparison with the large enterprises. In the manufacturing process SMEs will use recycled resources at lower prices which is a great opportunity for increasing the competitiveness. The new business could enable to use the environment management by Eco-Management and Audit Scheme (EMAS). In this way the SPV will improve the environmental and financial situation. By using new PPP business model in the waste management business, SPV will also disseminate its environmental added value to stakeholders and to the recycling society.

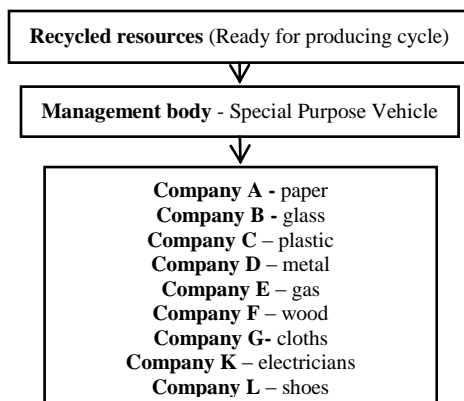


Figure 3. SPV management body

Source: the report's authors

Step 4: Creation of the SPVs management board

The SPV is predicted to have innovative managerial board including four functional units charged with recycling, incineration, composting and reuse activities. The Functional units' activities are connected to the business with the third parties.

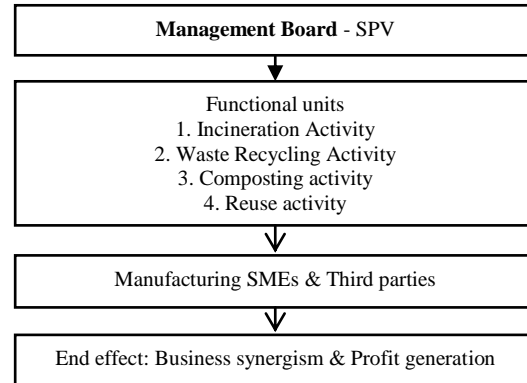


Figure 4. Managerial process of the SPV – management Board

Source: *Project Governance: a guidance note for public sector projects, November 2007. HM Treasury* (the figure contains changes made by the author)

The main purpose of the management board is the creation of resource balance between waste management activity and the needs of the manufacturing SMEs' as well as the business with third parties.

Step 5: Creation of the principal community-to-community

In the scholar inquiry is created the principle *community-to-community*. First, the principal encompasses connections between separate waste collection volume, the SPVs' profit and expenditure level, as well as households' annual waste fee. Second – the figure depicts the possibility of the development of Bulecopack JSC with interaction of the crowdfunding strategy.

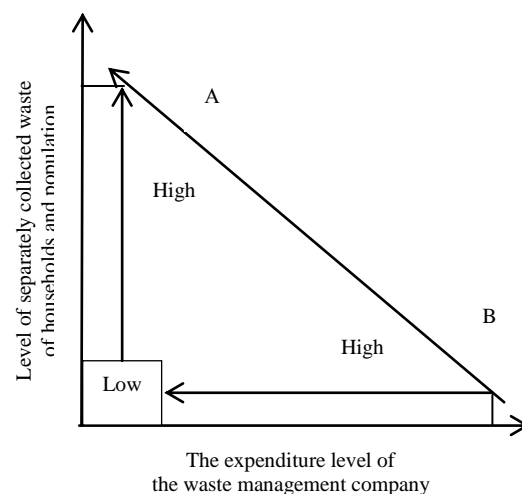


Figure 5. The effectiveness levels in the separate waste collection process.

Source: article author

First, the separate waste collection system supports the private sector to receive sorted wastes for the management process, consequently the SPV expenditures will go down. That is explained by the move from the curve from B to A.

In the next figure is continued the connection from the first one. The higher volume of separately waste collection leads to a lower household annual waste fee. This is a positive effect of the SPV management activity. The strategic masterpiece of the outcome is based on a prime cost of the waste recycling and placement of the manufacturing SMEs with the recycled resources. (Part of the SPV).

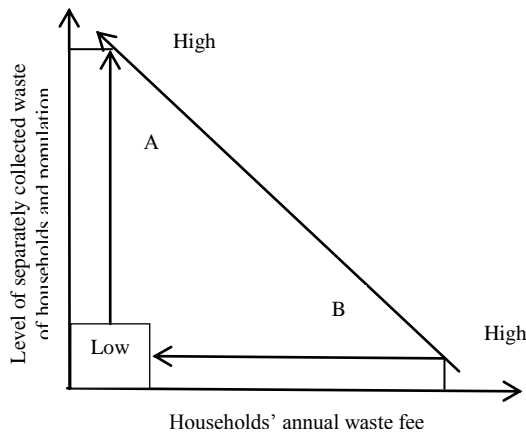


Figure 6. Incentive household level for separate waste collection

Source: article author

Bearing in mind the logic of the scientific analyses is established the **Incentivize ratio (Ir)**. **Incentive ratio** = “SWC” in tons / “HF” (money)

The separate wastes collected by the households and the population (SWC) – the whole scale of separately generated waste on an annual base.

Households' annual waste fee (HF) – the whole households number in the metropolitan.

Second, on the next figure is depicted the establishment of the SPV, it is provoked by the funding shortages of the Bulecopack JSC.

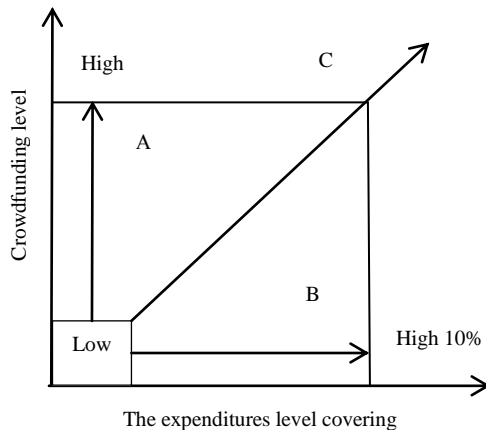


Figure 7. Connection between crowdfunding strategy and the SPV

Source: author of the article

In point C is the optimal outcome. It is assumed that 10% of the expenditures would be covered by crowdfunding strategy. The crowdfunding strategy [9] in waste management business creates the following end results:

- Purchasing of additional land, equipment and construction of the additional waste management build;
- Creation of the new monitoring level provided by the households;
- High social democracy level for private sector and society;
- Part of the crowd will be awarded with watches made by the recycled wood.

The strategy is possible to be realized by crowdfunding platform only for the amount of 10% of all additional funding, intended for the SPV creation, while the SMEs share is 90%. On the next part of the report is established the scientific research.

### The wording of the experiment

The experiment research is based on a pretest process, which is connected to the group of six managers from the public and private sector in waste management, PPP and manufacturing business. The pretest group aims to give clarifications in elaboration of the questionnaire and the purpose of the posttest group is an acknowledgement of the organizational mechanism PPP in waste management business. The posttest group consists of 24 experts from public and private sector.

Table 2. Pretest and posttest experimental group design

Group	Pretest score	Treatment	Posttest score
Experimental group	O1	X	O2
Treatment effect = (O2 – O1)			

Source: Uma Secaran

### Defining the hypotheses

In the experiment are defined null and alternative hypotheses. Null hypothesis – there is no connection between variables. Alternative hypothesis – there is a statement for existing the connection between two variables. [10], [11].

1). H0: Impossible interaction between model PPP with manufacturing business by accepting the good practice in European Union.

1). H1: Creation of the business model PPP in the sphere of waste management business in accordance to the manufacturing SMEs and applicable good practice in European Union.

2). H0: Useless inclusion of all treated volume of non-hazardous wastes in manufacturing process

of SMEs because it will decrease the competitiveness level and market share.

2). *H1*: Inclusion of all possible non-hazardous treated wastes from “Bulecopack” JSK will provide the manufacturing SMEs with increased competitiveness level and market share.

3). *H0*: Impossible creation of the incentives for the community by inclusion of the separate waste collection system with aim to be decreased an annual waste fee, because of the fact that SPV will grow up profit and the innovative principal “community-to-community” will be created.

3). *H1*: Building up the new principal “community-to-community” through creation of the incentives for the community in separate waste collection process by decreasing the annual waste fee and enlargement of the profit of the SPV.

4). *H0*: Impossible creation of the business synergy and high competitive level for the SPV.

4). *H1*: Creation of the SPV provides business synergy and high competitive level.

5). *H0*: Negative effect and managerial added value by creation of the SPV with one managerial board with four functional units.

5). *H1*: Positive effect and managerial added value by the creation of SPV with one managerial board with four functional units, concerning recycling, incineration and composting process, as well as reuse of wastes.

3. Framework of the variables in the research. In the current paper are included dependent, independent, modelling and intervening variables.

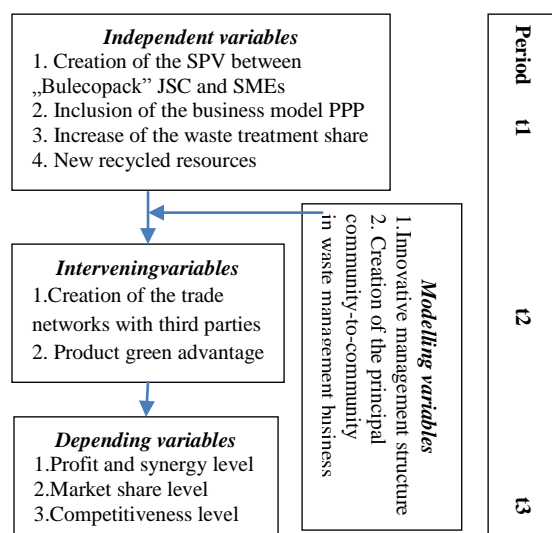


Figure 8. Variables in the scholar inquiry

Source: author of the article

### Choosing of the research instrumentation

Research instrumentation includes interview and questionnaire survey along with experts from the public and private sector.

The scientific research is being conducted in November 2015. First - with five experts, by conducting of the interview, and second - by a questionnaire survey with 12 experts from public sector and 12 from private sector. The purpose of the interview is to set up clear and professional questionnaire and to be tested the creation of the organizational mechanism PPP in waste management business. The questionnaire survey aims rejection or confirmation of the hypotheses.

#### Stage one: Conduction of the interview

The respondents were asked five key questions in connection to application of the organizational mechanism PPP in waste management business. The answers are dichotomous – yes or no.

1. Does the business model PPP create added value in the waste management process? Yes
2. Is the private sector engaged enough in the process of waste management business? No
3. Is it possible an implication of the business model PPP in Bulgaria? Yes
4. Could waste management business underpin the increase of the competitiveness of the SMEs? Yes
5. Is it possible a creation of the social effect for the households in relation to annual waste tax fee? Yes

In accordance to the found responds is marked a fully acceptance of the posted key moments in the creation of the organizational mechanism PPP in waste management business. Thus, the questionnaire is elaborated with five detailed questions intended for public and private experts.

#### Stage two: Conducting of the questionnaire survey

The respondents included in the survey were asked to answer five questions, which were the same for the public and private experts.

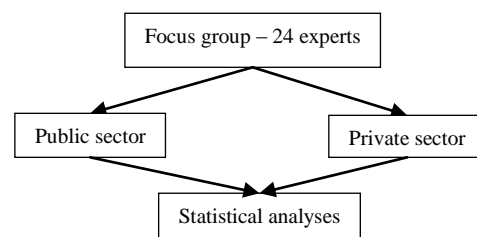


Figure 9. Conducting of the questionnaire survey

Source: authors of the paper

#### Stage three: Results from the conducted questionnaire survey.

The extracted results from the private experts amounts to 95% and the results from the public experts amount to 92%, hence the hypotheses confirmation is being fully positive.

**Table 3.** The results from the conducted questionnaire survey

1.Is it possible a creation of the business model PPP, which is applicable in waste management business and simultaneously in the manufacturing SMEs by inclusion of the good European practice?
Public experts 94% Private experts 99%
2.If the inclusion of all non-hazardous wastes in "Bulecopack" JSC business will provide the manufacturing SMEs with grater competitiveness level and market share?
Public experts 87% Private experts 93%
3.Is it possible a connection between separate waste collection systems, annual waste fee and crowdfunding strategy to be set as a new "community-to-community" principal?
Public experts 88% Private experts 92%
4.Does the establishment of the SPV provide a synergy and high competitive level?
Public experts 95% Private experts 94%
5.Is it effective, on a managerial view point, the SPV to be managed by a managerial board with three functional units?
Public experts 96% Private experts 97%

**Source:** author of the report

Consequently the final results are statistically significant and the creation of the organizational mechanism PPP in waste management business is accepted.

### Conclusion

The innovative business partnership between "Bulecopack" JSC and the manufacturing SMEs gives opportunity for sustainable creation of the circular economy in our agenda. The organizational mechanism PPP in waste management business shows us, how the wastes could be managed effectively and to be developed an environmentally based production. The inclusion of the crowdfunding strategy in the SPV establishment leads to inclusion of the society in providing the community services by a modern private business strategy.

The innovative principal *community-to-community* possesses a high level of fairness for the society and the manufacturing business. It also provides sustainability in the creation of the organizational mechanism PPP in waste management business in Bulgaria and European Union, as a whole.

### References

- [1] Moving towards a circular economy, DG Environment, EU, [http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm)
- [2] Ministry of environment and water, Bulgaria [http://www.moew.government.bg/files/file/Waste/Opakovki/Zapoved\\_347\\_210515\\_OPAK.pdf](http://www.moew.government.bg/files/file/Waste/Opakovki/Zapoved_347_210515_OPAK.pdf)
- [3] Institute for European environment policy (IEEP), 2010
- [4] UN, EC for Europe, Guidebook on Promoting Good Governance in PPP, New York, Geneva, 2008, p.2-4.
- [5] Guidelines for Successful Public – Private Partnerships, European Commission, DG Regional Policy, 2003, p. 18.
- [6] Public-private partnership, Handbook, Asian Development Bank, [www.adb.org](http://www.adb.org), Publication Stock No. 071107, p.27-43.
- [7] the Treaty on the Functioning of the European Union, 2008
- [8] „Think Small First”, 2008

- [9] Scott Steinberg, Rusel deMaria, How to raise money for any startup, video game, or project, 2012, p.3-9.
- [10] Uma Sekaran, Research methods for business, 4th edition, Southern Illinois University at Carbondale, 2003, p.105.
- [11] Tylor, Courtney, "The difference between the null hypothesis and alternative hypothesis.

### About author



The author is PhD student in the University of National and World Economy, Bulgaria, Faculty of Management. The doctoral thesis is titled: Organizational mechanism for public-private partnership. The author's professional experience is in the private sector, where he worked as an assessor, regarding bank activities. The professional experience in the public sector is 6+ years. The author held the post as a deputy mayor in Triadiza district, Sofia municipality. Two years later – as a financial controller in Ministry of Finance. Now he works again in the public sector as a chief expert in Ministry of Interior. Both working activities in the ministries are in the field of international projects.