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POLITICS OF THE SUSTAINABLE DEVELOPMENT OF CITIES IN THE AREA OF ENVIRONMENTAL PROTECTION: WITH THE EXAMPLE OF WARSAW

POLITYKA ZRÓWNOWAŻONEGO ROZWOJU MIAST W ZAKRESIE OCHRONY ŚRODOWISKA NA PODSTAWIE WARSZAWY

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Streszczenie. Miasta będące motorem wzrostu gospodarczego, innowacyjności i tworzenia nowych miejsc pracy odgrywają kluczową rolę w rozwoju regionalnym. Strategie tworzone w celu ulepszenia warunków życia na obszarach miejskich opracowywane są przez władze miast. W artykule koncepcja zrównoważonego rozwoju obszarów miejskich na tle europejskiej polityki zrównoważonego rozwoju oraz koncepcja miejskiej polityki klimatycznej są przedstawione. Ponadto główne europejskie oraz światowe koncepcje i inicjatywy miast zostały opisane w artykule. Na zakończenie Warszawa jest zaprezentowana, jako jeden z członków „Porozumienia między burmistrzami” a plan działań na rzecz zrównoważonej energii dla Warszawy w perspektywie do 2020 r. jest zobrazowany, jako przykład realizacji zrównoważonej polityki energetycznej na poziomie miasta.

Key words: renewable energy, sustainable development, urban policy.

Słowa kluczowe: ochrona środowiska, odnawialne źródła energii, polityka miast, rozwój zrównoważony.

INTRODUCTION

In the future, most people will be living in cities (UN 1987). Urbanisation is a part of the process of development. The population living in urban areas is expected to grow from 3.6 billion in 2011 to 6.3 billion in 2050. In 2011 78% of the population of developed countries lived in urban areas (UN 2012). Air, water, noise, and solid waste pollution problems have become a threat; to the health of city inhabitants, to their economy, and to their jobs.

It is not clear if the EU should be involved in the preparation of the concept of the urban policy or it would be more appropriate to leave it to the regional or local government. The involvement of the EU can be justified on two levels: conceptual and practical (Swianiewicz et al. 2011).

To combat climate change one of the key goals of cities governments should be to raise awareness of the importance of environmental protection among the urban population. European cities should become places of advanced social progress and environmental regeneration, as well as places of attraction and engines of economic growth based on an integrated, holistic approach in which all aspects of sustainability are taken into account (EC 2011).

The need for international cooperation among cities to combat climate change resulted in the creation of different city initiatives. There are several platforms which gather thou-

sands of cities exchanging information on best practices, technologies, different processes and knowledge concerning different aspects of city organisation.

The aim of this paper is to conceptualise the idea of sustainable urban development in the context of climate policy and to emphasise the importance of the development of city initiatives. Particular attention is given to programs allowing the achievement of sustainable development goals in the area of energy and climate in the city of Warsaw.

Sustainable urban development and climate policy

The concept of sustainable development was presented in 1987 in the Brundtland report as a process which ensures meeting the “needs of the present without compromising the ability of future generations to meet their own needs” (UN 1987).

Sustainable development should be understood as a process of change rather than a fixed state of harmony. Changes in resources, investments, technologies and institutional changes are to be made having taken into consideration present and future needs in a way to meet the basic needs of all and to extend to all the opportunity to satisfy their aspirations for a better life. The Brundtland report pointed out the important role of cities in global sustainable development, highlighting that cities are responsible for a high share of both world resources used and pollution due to high concentrations of industry and high energy consumption.

In 1972 this concept was discussed internationally for the first time during the UN Conference on the Human Environment in Stockholm and further promoted during the United Nation Earth Summits in 1992, 2002 and 2012. In 1997 the Kyoto Protocol was signed obligating developing countries to reduce their GHG emissions. At the summit special attention was given to public transportation systems, congestion in cities and health problems caused by air pollution and smog (Table 1).

Sustainable development is one of the goals of the European Union (EU) under the Lisbon Treaty. The environmental aspect, described in the sustainable development strategy, was added to the original strategy covering economy and social dimension.

The topic of the city is not explicitly dealt with by either the EU SDS or Europe 2020. In 2012 the European Commission published the 7th Environmental Action Programme (EAP) committing the EU to “transforming itself into an inclusive green economy that secures growth and development, safeguards human health and well-being, provides decent jobs, reduces inequalities and invests in and preserves natural capital” (COM 2012). Priority objectives for local, regional and global challenges to be reached by 2020 are “to enhance the sustainability of EU cities” and to “to increase the EU’s effectiveness in addressing regional and global environmental and climate challenges” (COM 2012). Improving the attractiveness of regions and cities is one of the priorities presented in the EU’s strategic guidelines for cohesion policy for 2000 to 2013.

Table 1. The concept of sustainable development in key international documents

International level			
Year	Event	Document	Description
1972	UN Conference on the Human Environment in Stockholm	Brundtland report	First concept of sustainable development.
1992	The Rio Summit, The Earth Summit, The United Nation Conference on Environment and Development	Rio Declaration on Environment and Development Agenda 21	Global plan of action for sustainable development adopted by developed and developing countries. Definition of three pillars of sustainable development: social, environmental and economic .
1997	Conferences of the Parties (COP-3)	Kyoto Protocol	Signatory nations committed to cut emissions of greenhouse gases, including carbon dioxide. Problems raised: transportation systems, congestion in cities and health problems caused by air pollution and smog.
2002	The Rio +10, The Rio Summit, The Earth Summit, The United Nations Conference on Environment and Development	Rio Declaration on Environment and Development and Agenda 21	Political commitment to sustainable development.
2012	The Rio +20, the Earth Summit +20, The Conference United Nations Conference on Sustainable Development	"The Future We Want" Work Paper	Main themes: green economy in the context of sustainable development and poverty eradication and the institutional framework for sustainable development.
European Union level			
2000	The European Council held in Lisbon	Lisbon Treaty	New strategic goal for the EU to become the most competitive and dynamic economy.
2001	The Gothenburg Summit	Sustainable development strategy (EU SDS)	Vision of sustainability of the EU economy aiming to ensure long-term prosperity, environmental protection and social cohesion.
2010	The European Council	Europe 2020	Strategy for smart, sustainable and inclusive growth.

Source: Author.

Sustainable urban development is defined as urban development that meets sustainability goals: achieving environmental preservation, social equity and economic development (OECD 2012). Sustainable urban development can be also understood as the capacity of a city to achieve a new level of socio-economic and demographic, as well as technological development (Mierzejewska 2008).

Most global and regional problems originate from cities (Alberti, Susskind 1996). The interdependence between cities and global environment implies that cities, which are sustainable at a local level cannot be sustainable at a global level due to outsourcing the unsustainable demands for natural resources. In the end the same cities will be touched by global environmental problems: climate change, acidification. (Alberti 1996)

Commissioner Margot Wallström confirms that cities hold the key to sustainable development ("vision" for sustainable cities at the opening session of Brussels' Green Week event on 12 June 2007). Therefore, global sustainable development should start at the local and regional level. Most cities have mechanisms for coping with problems arising from an increasing number of citizens or economic crisis. But there are some cities that face problems of deteriorating infrastructure, environmental degradation, inner-city decay, and neighbourhood collapse. The cities in developing countries are growing faster than the capacity of administration to cope with shortages of housing, water, exposure to air and water

pollution and industrial hazardous waste. The challenge is to manage the process of urbanisation in order to avoid a severe deterioration in the quality of life (UN 1987).

To become sustainable cities must (Alberti 1996):

- reduce the need for certain resources and increase the capacity of the environment at the local, regional and global level, and thus the ability of the natural environment to absorb and neutralise the external effects of human activity;

- recognise the needs of all people, not just those living within the city boundaries, and not only of present generations but also of future.

Sustainable cities opt for renewal rather expansion, for consolidation of the urban fabric and improvement of the suburbs (Mega 2011).

Climate change increasingly threatens cities (OECD 2012). Cities are major contributors to climate change. Around half of the world's population live in urban areas. In 2011 78% of the population of developed countries lived in urban areas (UN 2012). Cities consume the vast majority of energy production worldwide – 60 to 80% and as such are responsible for an equivalent share of global CO₂ emissions.

The characteristics of European cities differ to a great extent according to indicators provided by Urban Audit concerning environmental situation. High diversity in the size of total land area and green space area can be noticed among the cities. Cities with a relatively large area in respect to the population are “greener”. Preserving and creating green spaces in the cities helps improve air quality (EC 2010b).

According to respondents of the survey (EC 2010a) air pollution is a major problem for capitals and large cities (in excess of 500,000 inhabitants) such as Athens, Budapest, Rome, Naples, Warsaw, Paris, Lisbon and London. In more than 60 European cities including several Italian cities, Łódź, and Katowice there were 25 days when the ozone concentration exceeded 120 µg/m³ in 2008 (EC 2012).

Some studies show that the metabolism and GHG emissions of a city strongly depend on its location (Kennedy et al. 2009). The number of heating days is an important determinant of the amount of energy needed to heat buildings. The means of power generation is another important determinant. Access to hydropower reduces the intensity of emissions. The development of clean technology also reduces the environmental impact.

City policy programs and initiatives

Prevention of climate change puts great pressure on cities. Cities are responsible for sectors that impact environmental sustainability and emit greenhouse gas emissions. Local and regional governments are responsible for providing solutions, within their legal and financial authorities, to the problems arising within their jurisdictions.

On the other hand there are many international level projects and tools to assist cities (OECD 2010):

- Harmonised greenhouse gas emission inventory and reporting protocols for cities to allow the monitoring of progress in mitigating emissions, to become active participants in international carbon markets,
- Regional impact science and other policy relevant research programmes to promote local understanding of climate change risk and policy options,
- Urban climate policy networks, building regular channels of communication among national planners, regional and local government officials, local stakeholders and decision makers about targets, goals, strategies, measures.

The European Commission encourages the sharing of experience and best practice solutions between countries which developed cost-effective, energy saving solutions to improve the quality of life in cities. It is the task of cohesion policy to support inter-city and international cooperation in formulating strategies to achieve economic growth while preserving the environment (EC 2010b). Cohesion policy supports integrated sustainable urban development across the EU through the investments of the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund (CF).

From a database point of view there was a large information gap related to common indicators that would allow comparison of cities across countries and measurement of progress (Alberti 1996, OECD 2010). Several database, like ESPON, the Urban Audit and Urban Atlas, were created to improve the availability and comparability of territorial data

The Urban Audit data collection, started in 2003, provides information and comparable measurements on the different aspects of the quality of urban life in European cities. 323 European cities were covered by the Urban Audit in 2009 covering information on demography, social and economic aspects, civic involvement, training provisions, environment, travel and transports, information society, culture and recreation. To confirm statistical data with the perception of the quality of life in the cities, a perception survey was conducted in 2006 and 2009 in 75 cities in EU27 (EC 2010a).

There are several initiatives focused on urban development which complement EU regional policy: the Covenant of Mayors, Concerto, CIVITAS, Smart Cities and Communities European Innovation Partnerships (SCC), the Green Digital Charter, the Urban Europe Joint Programming Initiative, the Green Capital Award, the Energy Efficient Buildings Public Private Partnership, the European Green Building Programme, the European Green Cars Initiative, the European Energy Research Alliance (EERA) Joint Programme on Smart Cities and the EIT Knowledge and Innovation Communities.

The Covenant of Mayors and the European Green Capitals initiative demonstrate how European cities are taking the lead in driving sustainable development. Over 4,500 mayors from more than 40 countries have committed themselves to going beyond the EU 2020 targets in order to improve citizens' quality of life. By preparing and implementing sustainable energy action plans they are planning to reduce CO₂ emissions by more than 20%. The main added value of the platforms and networks consists of disseminating information, pro-

viding financial and organisational support. The initiative provides tools to generate new jobs and income, as well as support to small and medium-sized enterprises (SMEs) (Committee of the Regions 2010). Energy Cities is the European Association of local authorities in energy transition created in 1990 to help coordinating of the Covenant of Mayors. The association represents more than 1,000 towns and cities in 30 countries helping the cities to exchange their knowledge and know-how in the field of sustainable energy.

The European Sustainable Energy Systems in Advanced Cities (SESAC) project was started by The Concerto initiative co-funded by the European Commission within the 6th Framework Programme. Delft (the Netherlands), Växjö Municipality (Sweden) and Grenoble (France) take part in projects aimed at decreasing CO₂ emissions while at the same time boosting the local economy. Kaunas (Lithuania), Miskolc (Hungary) and Vastseliina (Estonia) are gaining knowledge and experience through the local energy studies which they are performing.

EUROCITIES network was founded in 1986. It currently includes 130 large cities in over 30 European countries. It is a political platform for major European cities towards European institutions. "Declaration on Climate Change" contains reflects the organisation's commitment to fighting climate change, and provides a framework for cities to adopt climate action plans.

Smart Cities and Communities European Innovation Partnerships (SCC) was launched by the EU in 2012 to develop demonstrations of energy, sustainable transport, smart information and information communication technologies (ICT) in the urban context. It will support existing and future EU initiatives for urban areas in the field of the environment (resource efficiency, water, waste, pollution, green infrastructures) and climate policies. Energy, transport and ITC industries have the opportunity to develop solutions in direct cooperation with cities to meet the needs of the city. Smart Cities combine diverse technologies to reduce their environmental impact and offer citizens better lives. EC supports selected cities in developing smart solutions that can then be copied by other cities in Europe. European Smart Cities Stakeholder Platform has been established to facilitate the exchange of relevant information on technological solutions and needs of cities, provide information on projects and improve policy at local, regional, national and EU level. The goal of the platform is to provide information on how national and EU policies and programmes can best support smart cities and to generate publicly and privately funded projects (COM 2012b).

Compact city concept is wildly developed in contemporary urban policy. The compact city appeared in order to deal with rapid urbanisation. The growth of urban populations stimulates the need for new planning systems that will take land preservation into consideration. Shorter intra-urban distances, leading to reduced distance being travelled, result in a lower consumption of energy and emission of greenhouse gases (GHGs) than sprawling urban areas (UN 2011). The goal of compact cities is to preserve natural biodiversity and rural lands around urban areas. Both European cities and non-European cities such as

London, Vienna, Copenhagen, Barcelona, Budapest, Berlin Hong Kong, China, Seoul, Tokyo, Toronto, Vancouver, Washington, D.C. and Chicago have developed a greenbelt policy to prevent urban sprawl. Farming placed around urban areas provides food for the city. Shipping distances are shortened which leads to decreased emissions from transport. The compact cities can increase efficiency of infrastructure, reducing maintenance costs for energy, transport, water supply and waste disposal. Short distances to get to urban services and jobs result in a smaller amount of time spent travelling, lower transport costs and therefore an increase in the quality of life. Most residents have access to local services either on foot or using public transport. Change in the means of transport from individual cars to public transport or bicycles causes the green growth of the city by creating bike paths, walking paths, and light rail. New green needs stimulate knowledge diffusion and thus economic growth. The core value of a compact city is its capacity to integrate urban policy goals such as economic viability, environmental sustainability and social equity (OECD 2012).

Eco2 Cities is a new initiative launched by the World Bank, as an integral part of the World Bank Urban and Local Government Strategy, to help cities in developing countries achieve greater ecological and economic sustainability (WB 2010). The number of megacities, cities with at least 10 million inhabitants, is predicted to increase to 29 in 2025 and it is predicted that there will be 46 cities with populations ranging from 5 million to 10 million by 2025. Asia has 11 megacities and by 2025 this number should double (OECD 2012). An Eco2 city uses the synergy and interdependence of ecological and economic sustainability. Innovative cities in both the developed and the developing world have demonstrated that with the appropriate strategic approach cities can use innovations to boost sustainable growth and to challenge the crises more easily. The Eco2 Cities Initiative provides cities with an analytical framework, methods and tools to adopt the Eco2 approach and help in gaining financial resources for investments in infrastructure (WB 2010).

City policies: Warsaw

Local authorities are forced to look for new solutions to deal with energy and climate problems. Poland needs a reform of national policy to meet environmental goals at the local level. Municipalities face problems with waste disposal, wastewater treatment, air pollution, and energy efficiency. Due to increased suburbanisation and urban sprawl, some Polish cities considerably increased production of renewable energy and energy efficient technologies. CO₂ emissions per capita in Polish cities are low but the possibility to increase energy efficiency and develop renewable energy generation technologies remains under-exploited. The trend across Polish cities towards suburbanisation directly impacts environmental quality. Energy consumption, especially in the transportation and construction sectors is influenced by urban densities and spatial organisation. The relocation of city residents to surrounding areas has created the phenomenon of urban sprawl. Increasing urban density could significantly reduce energy consumption in urban areas (OECD 2011).

All European agglomerations are in the phase of policy development in which they must take into consideration the needs of society for a better, healthier, pollution-free life. On the other hand capitals and big cities take the role of leaders in the implementation of sustainable development programs. Warsaw is the leader among Polish cities in implementing sustainable development policies by actively taking part in different European and international suggestions for sustainable development. Warsaw is a member of the Eurocities – association, which gathers European as well as international cities, where the main issues are climate, inclusion and recovery since 2002. The Polish capital is also a member of the C40 Cities Climate Leadership Group (C40), a network of the world's biggest cities taking action to reduce greenhouse gas emissions. Warsaw is also a member of the European Network "Énergie Cités" which supports Polish covenant signatories and candidates for signatories by cooperating with local authorities in promoting energy efficiency and renewable energy use.

Thirty six Polish cities had signed the covenant by the beginning of 2013. These cities committed themselves to improving energy efficiency and climate protection. Warsaw wanting to become a leader in sustainable development implementation, became a member of Covenant of Mayors in 2009. The Warsaw city council adopted the Sustainable Energy Action Plan for Warsaw for 2020 prepared by a consortium of companies: the Polish National Energy Conservation Agency and the National Energy Conservation Agency.

The action plan foresees several undertakings in the area of (City of Warsaw 2011):

- construction, including new and exhaustively retrofitted buildings,
- city infrastructure, i.e. heat distribution networks, street lighting systems, etc.
- land management and urban planning,
- renewable energy sources,
- transportation policy,
- civil, in the area of the involvement of residents,
- the pro-efficiency behaviour of residents, consumers and enterprises.

According to a survey on the perceived quality of life in European cities (EC 2010a), Warsaw residents pointed out air and noise pollution as an important problem they face in everyday life. Implementation of the action plan should considerably change the situation. The action plan assumes.

The value of the CO₂ emissions in Warsaw should not exceed 80% of CO₂ emissions during the base year 2007 (main goal) and the value of the final energy consumption in Warsaw will not exceed 80% of final energy consumption during 2007 (additional goal). This means that CO₂ emissions should not exceed 10 362 387 Mg CO₂/year and final energy consumption should not exceed 22 715 545 MWh. At least 20% of energy will come from renewable sources. Warsaw's commitment includes CO₂ emission reduction by 6 118 995 Mg per year which will allow energy savings of 10 538 185 MWh per year. The cost of the action plan is 16.5 billion PLN, including 5 billion PLN from the city budget (Miasto stołeczne Warszawa 2011).

The main source of emissions in Warsaw comes from the energy sector (78%) followed by transport (15%) and the municipal waste management sector and municipal wastewater treatment processes (7%) in 2007.

The housing sector consisted of around 44 million square meters of apartments and around 15 million square meters of administration buildings and public facilities in 2008. A large part of panel buildings in Warsaw was constructed using inefficient technologies due to policy, which at that time was not focused on energy efficiency. Therefore, there is considerable potential in the housing sector to reduce CO₂ emissions through complex thermal retrofitting of buildings in a standard close to the Thermal Retrofit Act. Activities in the housing sector, municipal residential buildings and public facilities should include (Miasto stołeczne Warszawa 2011): modernisation of the method of heat supply, improvement of the ventilation system, replacement of external doors and windows, modernisation of the heating system and, where possible, the use of equipment, using energy from RES, reduction in heat demand for the preparation of hot tap water, modernisation of street and outdoor lighting. For new constructions advanced technologies like low carbon houses, passive houses and energy efficient houses are used. Thermo modernisation of buildings in the public sector will yield a 106 836 Mg emission reduction by 2020. This means annual savings of 359 718 MWh.

The energy sector in Poland and in Warsaw is based mostly on coal. To attain the goals listed in the action plan, it is needed to; implement new technologies which reduce the consumption of heat, increase the use of new technologies based on renewable energies, and modernise the heating network (Miasto stołeczne Warszawa 2011). Actions seen to be considerations for the energy and heat sector (Miasto stołeczne Warszawa 2011): improving the efficiency of energy generation, modernisation or replacement of old turbines, use of waste heat recovery units producing electricity to spin a power turbine that produces electricity, production of electricity in thermal power generating units, use of solar panels, use of photovoltaic systems, cogeneration, micro-cogeneration, use of biomass power plants. The use of biomass in power plants should increase from 2% in 2010 to 25% in 2020. Warsaw is going to increase the share of energy produced from waste to 8% by 2016. Modernisation of the incineration plant in Warsaw – Zakład Unieszkodliwiania Stałych Odpadów Komunalnych – by 2018 will allow thermal treatment of 390 thousands of tons of waste to be converted into energy and heat for Warsaw (Miasto stołeczne Warszawa 2012).

Public transport is one of the sectors of the action plan. Most of the actions listed in Strategy for Sustainable Development of the Warsaw Transportation System to the year 2015 and beyond till 2015 (Transport Strategy) will serve to attain action plan objectives. According to the Strategy for Sustainable Development of the Warsaw Transportation System by the year 2015 and beyond (Miasto stołeczne Warszawa 2010) the main goal of Warsaw transport policy is the rationalisation and development of the transport system in order to create favourable conditions for the city residents to transfer and relocate goods

while reducing harmful effects on the environment and health. One of the main goals of the transport strategy points out the need to decrease the pressures of transport on city residents and improve the state of the environment by noise reduction, health care as well as environmental protection. The transport strategy assumes that although there is an increasing trend in the use of individual cars, the key role in the transport system will be given to rail transport: tram, metro and rail. According to prognostics prepared for the transport strategy, the improvement of rail transport will create incentives for city residents to use public transport. One of the main tasks is to change a perception of the means of transport as well as passenger behaviour by encouraging city residents to walk or to use a means of transport other than car (bike, metro, tram). The excessive use of individual cars is the least efficient means of transport as far as emissions per passenger and the amount of space used are concerned. Several actions on modernisation and development of tramway infrastructure, development of underground, creation of bike paths, joint single ticket for all means of public transport, integration of transport systems, improvement of bus system, replacement of vehicular and rolling stock by buses using alternative fuels are expected to reduce transport fuel consumption and pollution emissions from transport in Warsaw.

The main threats during the realisation of the action plan result from changes in the national law concerning the EU Climate & Energy Package, problems with the financing of tasks due to budget cuts at the national or regional level, and a lack of the acceptance of the implementation of the action plan (Miasto stołeczne Warszawa 2011).

By the middle of 2013 Warsaw had bought 186 trams with kinetic energy recovery systems, 168 buses were hybrid buses, 35 metro trains and 17 trains for Fast Urban Railway. 2100 city bikes with 125 stations are available for Warsaw residents and tourists.

The advantage of the implementation of the action plan is the reduction of the impact of the city on the environment as well as promotion of the pro-environmental behaviour of city residents and creation of social awareness concerning climate change.

CONCLUSIONS

Cities play an important role in the global economy. The management and special design of cities are important issues in coping with global sustainable development. International agreements are of the utmost importance in creating a strong climate policy and introducing sustainable development. These agreements will show the way to elaborate appropriate schemes to help regional and local authorities put local policies on track towards sustainable development.

Stakeholders' and citizens' involvement is essential for improving the environment in the city therefore; there is a need for data, not only at a national level but also at an international level, to perform reliable comparisons. City platforms serve to exchange data on basic

information on the cities, on projects performed to reach sustainable goals and they provide analytical and practical help to the cities' governments.

Becoming a member of the Covenant of Mayors in 2009, Warsaw signed a commitment to improving energy efficiency and climate protection. Warsaw has become the leader in implementation of sustainable energy development plans in Poland: decreasing energy use, new sustainable transport schemes, and implementation of renewable energy plans within the city area. As the capital, which has an important political and economic impact in Poland, Warsaw has become an example of good environmental practices as in behaviours that should lead the city government into a new climate reality. The advantage of the implementation of the action plan is the reduction of the impact of the city on the environment as well as promotion of pro-ecological behaviour of city residents and creation of social awareness concerning climate change.

By 2013 four thousand five hundred mayors from forty countries, including thirty five Polish cities had joined the Covenant of Mayors. These numbers indicate best the great need for such initiatives at an international level.

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