

Bożydar Ziółkowski*

ENVIRONMENTAL LABELS AND DECLARATIONS IN PUBLIC POLICIES OF POLAND

ETYKIETY I DEKLARACJE ŚRODOWISKOWE W POLITYKACH PUBLICZNYCH POLSKI

Abstrakt

Wiele krajów implementuje do swojej polityki mechanizmy wspierające ekoznakowanie. W Unii Europejskiej zagadnienie ekoznakowania stało się przedmiotem szerszego zainteresowania po przyjęciu przez Komisję Europejską w roku 2015 planu działania na rzecz gospodarki o obiegu zamkniętym (Circular Economy Action Plan). Trwający obecnie proces transformacji UE w kierunku gospodarki o obiegu zamkniętym znajduje się na etapie diagnozy potrzeb społecznych oraz projektowania możliwych rozwiązań w polityce publicznej. Istotnym problemem prowadzonej debaty jest stosunkowo ogólne podejście do konsultowanych zagadnień, przy jednoczesnym braku analizy z perspektywy krajowej – dotyczy to także kontekstu ekoznakowania. Aby zmniejszyć lukę poznawczą ujawniającą się w procesie przedmiotowej deliberacji, celem niniejszego artykułu jest zbadanie oraz identyfikacja w obrębie krajowych polityk publicznych istniejących inicjatyw wsparcia programów ekoznakowania. Analiza kontekstowa dostępnych dokumentów dostarcza diagnozy niskiego zaawansowania interwencji publicznej w zakresie rozwoju etykiet i deklaracji środowiskowych na terenie Polski.

Słowa kluczowe: etykiety środowiskowe, deklaracje środowiskowe, ekoznakowanie, polityka publiczna, gospodarka o obiegu zamkniętym

Introduction

Environmental labels and declarations¹ are one of the tools in environmental management (*ISO 14020*, 2000). Environmental labelling is focused

* Zakład Zarządzania Przedsiębiorstwem, Wydział Zarządzania, Politechnika Rzeszowska, ul. Powstańców Warszawy 10, 35-959 Rzeszów, e-mail: bozydarz@prz.edu.pl, ORCID ID: 0000-0002-7866-3694

¹ In the present paper, the formal phrase regarding environmental labels and declarations is linked interchangeably with ecolabelling or environmental labelling, green labelling as well as environmental claims or environmental labelling and information schemes.

on communicating in a standardized way the environmental aspects of products. The popularity of voluntary ecolabelled products and environmental declarations is rising (Castka & Corbett, 2016), mainly because of the growing public need to make informed consumer choices. This is a global process resulting from the social concern of the three following problems, i.e.: “safety, health and environmental performance” (Xu et al., 2017). In the era of globalization, the decisions of customers on one continent affect other parts of the world, e.g., purchasing products containing non-certified by RSPO palm oil has a significant impact on burning rainforests in Malaysia and Indonesia, which also leads to extinction of animals. Both well-known threats, such as global warming, and new types of risks, such as microplastic pollution of water, require the assistance of ecolabelling programmes. However, because of existing barriers, e.g. lack of support for strategic plans (Mak & Crane, 2009) in public policies, the deployment of ecolabelling programmes is lower than expected in some regions. The current main regulatory facilitator for ecolabelling programmes is expected to be the policy on circular economy in the European Union (EU). The circular economy concept became a priority in the EU policy, when the Circular Economy Action Plan was released in the year 2015. Nevertheless, to guarantee the successful development of environmental labels and declarations systems, the scale of dissemination of ecolabelling plans in public policies of EU member states remains a key issue. The knowledge deficiency in this field is a real roadblock to strategic planning for governmental decision makers. In the present paper, the problem of knowledge gap concerning distribution of ecolabelling in public policies of Poland was investigated. Thus, the study examines the challenges reported in the available scholarship regarding the necessity of dialogue and deliberation as well as knowledge production in terms of policy design and processes prior to reform implementation (Zybała, 2012). The research objective of the paper is examination of the presence of strategic regulations and regulatory prescriptions on ecolabelling in public policies of Poland. The research conducted was based on the method of content analysis. The author of the present article assumed (and tested) the hypothesis that the distribution of ecolabelling in public policies of Poland before the year 2020 was low.

The idea of ecolabelling

Labelling is a way of communicating information about products to consumers by means of symbols (D’Souza, 2000). The environmental aspects of products are articulated by ecolabels and claims aimed at transmitting environmental information (Charter et al., 2001) indicating that a product meets established standards (Witek, 2017). The impact of ecolabels is

favourable, because consumers perceive brands with ecolabels as more environmentally friendly versus other items, regardless of the type of a given product (D'Souza, 2000). There are also groups of consumers who are prone to buying ecolabelled products even of lower quality than their alternative, non-ecolabelled counterparts (D'Souza et al., 2006). The ecolabels support the consumers cognitive process of decision making (Thøgersen et al., 2010) by simplifying it (D'Souza, 2000).

Ecolabelling has three distinctive forms which are all related to a product (or to any goods or services). They have been regulated by many organizations up to date but the most established standards in this field were issued by the International Organization for Standardization (ISO) as follows:

- ISO 14024:1999, Environmental labels and declarations – Type I environmental labelling – Principles and procedures.
- ISO 14021:1999, Environmental labels and declarations – Self-declared environmental claims – Type II environmental labelling.
- ISO/TR 14025:2000, Environmental labels and declarations – Type III environmental declarations.

Ecolabelling programmes or schemes, such as Nordic Swan, EU Ecolabel, Blue Angel (Type I environmental labelling equivalent), are aimed at certifying and labelling products that satisfy environmental standards “based on the assessment of a given product’s environmental impact” (EPA, 1993).

Type II environmental labelling, i.e., the self-declared environmental claims, concerns declarations established by business managers which do not need to be certified by independent bodies. They are also referred to as “green promises”, “credence claims” (Petty et al., 1994), “environmental claims”, “environmental marketing claims” (EPA, 1993) or “informative environmental self-declaration claims” (Crnobrnja et al., 2009), because there is neither standardized nor regulated control and verification of such claims. Prevalent environmental claims include: “environmentally friendly”, “Respect For The Environment”, “Mercury and Cadmium Free”, “biodegradable”, “recyclability”, “reduce solid waste”, “made from recycled content”, “requires less energy to produce and deliver”, “contains no CFCs”, (Petty et al., 1994) “environmentally safe”, “pure”, “landfill safe”, “refillable”, “ecologically safe”, “organic”, “no tropical woods” (EPA, 1993), “The Nespresso AAA Sustainable Quality™ Program” (Dekhili & Akli, 2014).

Type III environmental declaration, such as e.g. EcoLeaf, Environmental Product Declaration, is defined as “quantified environmental data for a product with pre-set categories of parameters based on the ISO 14040 series of standards” (ISO/TR 14025:2000, 2000) describing the LCA approach.

The international interest in ecolabelling caused proliferation of the items within the series of ISO 14020 standards, which are steadily imple-

mented as national versions by single countries (e.g., in Poland as PN-EN ISO 14020:2003, PN-EN ISO 14021:2016-06, PN-EN ISO 14024:2018-05, PN-EN ISO 14025:2010). The valid standards from the series of ISO 14020 and standards under development are presented in the table number 1 below:

Table 1. Environmental labelling ISO 14020 standards.

Published standards	
ISO 14020:2000	Environmental labels and declarations – General principles
ISO 14021:2016	Environmental labels and declarations – Self-declared environmental claims – Type II environmental labelling
ISO 14024:2018	Environmental labels and declarations – Type I environmental labelling — Principles and procedures
ISO 14025:2006	Environmental labels and declarations – Type III environmental declarations — Principles and procedures
ISO 14026:2017	Environmental labels and declarations – Principles, requirements and guidelines for communication of footprint information
ISO/TS 14027:2017	Environmental labels and declarations – Development of product category rules
Standards under development	
ISO/CD 14020	Environmental labels and declarations — General principles
14021:2016/DAMD 1	Environmental labels and declarations — Self-declared environmental claims – Type II environmental labelling — Amendment 1: Carbon footprint, carbon neutral
ISO/WD TS 14029	Mutual recognition agreements between Type III Environmental Declaration (EPD) Programme Operators — Principles and procedures

Source: own work based on the ISO data (TC > ISO/TC 207, 2020).

In the European Union, the environmental labels and declarations schemes have been promoted so far within numerous types of environmental policy both at the EU level (e.g., integrated product policy) and nationally (e.g., environmental product policy).

Public policy contribution to ecolabelling

The interest of business in ecolabelling is triggered by the consumers' willingness-to-pay for the environmental hallmarks of products (Dosi & Moretto, 2001). Environmental labels can act as market regulators, which allow only the goods and services that fulfil environmental standards to enter the “green product markets” (Domingues et al., 2015). Unfortunately, in many cases the environmental information is used untruthfully by com-

panies, undermining as a result the value of truth which constitutes the ground for market relations.

Dishonest communication practices on the part of some organizations with regard to their environmental issues include: false claims concerning environmental impact of products, lack of any information about the environmental impact of a company, finger-pointing and attracting the public attention to issues other than environmental activities of a given party. The afore-mentioned unethical practices, called correspondingly “green-washing”, “green-blushing”, “green-bashing”, constitute some of the disclosure problems occurring at different stages of the information reporting process. There can be distinguished five stages of the process in development of corporate disclosure policy on reporting non-financial information: “stand back and wait approach, transparent and accountable, alignment of stakeholder expectations and corporate strategy, build system based on stakeholder expectations and a fully integrated approach” (Maj et al., 2018; Sri-dhar, 2012). These information asymmetry problems last unsolved in many countries for a long time undermining steadily the trust of society in environmental claims and posing some of the main challenges to the dissemination of ecolabelling. In other regions, however, the social criticism of these misleading phenomena triggered governments to develop public policies positively contributing to environmental labelling schemes.

Public policies deliver solutions to systemic problems. These policies are realized by different instruments, such as legal, social or business regulations, cooperation, argumentation, debating, researching, motivating, performance indicators, evaluation, policy analysis, institutions (public offices and social networks) (Zybała, 2012). The instruments of public policies applied for the development of environmental labels and declarations are as follows: strategic plans, which should include consumer education, to raise awareness (Charter et al., 2001; Horne, 2009) as well as product compliance and enforcement of the ecolabelling schemes (Mak & Crane, 2009), procurement policy (Horne, 2009), establishment of action programmes, legislation and codes of good practice or guidelines regarding ecolabelling (Prag et al., 2016), “improving transparency and maintaining high standards” (OECD, 2016).

Ecolabelling is deemed “the second generation of environmental policy instruments”, next to national environmental plans and environmental taxes (Kern et al., 2005).

The basic requirements for effectiveness of traditional labelling schemes are consumers’ interest “in the information provided by the label” as well as clarity and simplicity of presentation (Kireeva, 2012). In case of the ecolabelling programme, the condition of its effectiveness is integration with environmental policy (Potter & Hinnells, 1994), including circular

economy, deemed as “environmentally sound economy” (Obrecht, 2020) and oriented towards resource management. Among the prevalent examples of such integration between environmental labelling and other environmental policy instruments there are nexuses such as: Life Cycle Thinking – ecolabels – ecodesign (Obrecht, 2020), green labels – sustainability reporting (Andrea Blengini & Shields, 2010) or sustainable consumption strategies (Horne, 2009), which finally result in the reduction of the environmental impact of consumption (Ihemezie et al., 2018).

The environmental labelling schemes can be supported by public policies applied at three levels, i.e., “governmental, non-governmental and within the supply chain” (Charter et al., 2001).

Countries which introduced public policies facilitating different forms of environmental labelling include: Australia, Canada, France, New Zealand, the European Union, the United Kingdom, and the USA. A more detailed picture of nationally differentiated types of contribution is provided by the following two examples. The national ecolabels are the main means to demonstrate the fulfillment of sustainability criteria, which constitute 95% of all requirements in the public procurement of the United States (Klintman, 2016). In the European Union, the business-to-consumer commercial practices regarding the marketing claims are protected by Unfair Commercial Practices Directive (Directive 2005/29/EC, 2005), which was amended in the year 2019 by another directive regarding “the better enforcement and modernisation of Union consumer protection rules” (Directive (EU) 2019/2161, 2019). None of the cited directives refers literally to ecolabelling, because they define the general principles of conduct. However, the main contribution to the deployment of environmental labelling in the EU is stipulated as part of the following: New Circular Economy Action Plan, the EU Green Public Procurement criteria, EU Ecolabel Regulation, the Product Environmental Footprint approach, Ecodesign and Energy Labelling Working Plan 2020-2024.

The role of ecolabelling in Polish public policies

The purpose of the research on the environmental labels and declarations programmes in Poland under discussion was identification of the scope of public policy enforcement. The method of content analysis was used to examine the group of 12 formal documents on public policies, which embraced the following items. The original titles of the documents are in Polish while English translations are provided in brackets:

- Mapa drogowa transformacji w kierunku gospodarki o obiegu zamkniętym (The Circular Economy Road Map),

- Polityka ekologiczna państwa 2030 (The 2030 State Ecological Policy),
- Krajowa Strategia Rozwoju Regionalnego 2030 (The 2030 National Regional Development Strategy),
- Strategia zrównoważonego rozwoju wsi, rolnictwa i rybactwa 2030 (The 2030 Sustainable Rural Development, Agriculture and Fisheries Strategy),
- Strategia Zrównoważonego Rozwoju Transportu do 2030 (The 2030 Strategy for Sustainable Transport Development),
- Strategia Bezpieczeństwa Narodowego Rzeczypospolitej Polskiej (National Security Strategy of the Republic of Poland),
- Strategia „Bezpieczeństwo energetyczne i środowisko” (The “Energy Security and the Environment” Strategy),
- Strategia rozwoju kapitału społecznego (Social Capital Development Strategy),
- Strategia „Sprawne Państwo 2020” (The “2020 Efficient State” Strategy),
- Strategia Innowacyjności i Efektywności Gospodarki „Dynamiczna Polska 2020” (“Dynamic Poland 2020” – Strategy for Innovation and Economic Efficiency),
- Adaptacja do zmian klimatu oraz ograniczanie skutków zagrożeń środowiska – program NFOŚiGW (Adaptation to Climate Change and Reduction of the Effects of Environmental Hazards – The National Fund for Environmental Protection and Water Management Programme),
- „Gospodarka o obiegu zamkniętym w gminie” – program pilotażowy NFOŚiGW (“Circular economy in the municipality” – pilot programme of the National Fund for Environmental Protection and Water Management).

The findings of the research were met with lukewarm interest on the part of decision-makers with regard to the deployment of ecolabelling programmes within the framework of analysed public policies. Thus, the research hypotheses of this paper can be accepted.

The identified and presented in the table nr 2 public incentives regarding the ecolabelling are not numerous but can constitute the background for the future research of this topic.

Table 2. Ecolabelling in public policies of Poland before the year 2020.

Lp.	Instruments of public policies	Context of contribution to ecolabelling schemes
<i>1</i>	<i>2</i>	<i>3</i>
1	Strategia zrównoważonego rozwoju wsi, rolnictwa i rybactwa 2030 (The 2030 Sustainable Rural Development, Agriculture and Fisheries Strategy)	Contribution to deployment of GMO-free label

1	2	3
2	Strategia Innowacyjności i Efektywności Gospodarki „Dynamiczna Polska 2020” (“Dynamic Poland 2020” – Strategy for Innovation and Economic Efficiency)	Contribution to deployment of ecolabelling as a measure for “creating conditions for the development of sustainable production and consumption, and a sustainable industrial policy”

Source: own work based on own research findings.

Remark: The table collects documents addressing the question of ecolabelling.

It is worth noting that the presented results give not only the picture of priorities among decision-makers but indicate also the low awareness of consumers who are “ecolabel promoters and users” (Thøgersen & Nielsen, 2016). Thus, the understanding and motivations of citizens to influence the development of ecolabelling in public policies is a key success factor in designing future programmes.

Summary

This article investigates the endorsement of ecolabelling in Polish public policies. The content analysis of strategic documentation and official regulations positively verified the research hypotheses that the distribution of ecolabelling in public policies in Poland before the year 2020 was low. The situation stems presumably from the early phase in adoption of the circular economy concept in the EU and in the majority of its member states. The results suggest also a low consumer motivation to influence development of ecolabelling in public policies.

The practical implication of this paper is collection of relevant knowledge on the state of deployment of ecolabelling in public policies. The knowledge on policy endorsement of ecolabelling in Poland should diminish the management decision gap at business and governmental levels. For this reason, the presented results should find also practical application among the scientists and decision-makers engaged into the process of public policy development as well as experts focused on evaluation of public policies.

It is worth noticing that the research corpus included admittedly important documentation, but it did not, however, amount to a complete database of existing public policies, be it countrywide or regional. This constitutes a considerable limitation of the research presented in the pa-

per, but it can serve as a welcome challenge for the future research on this question.

The outcome of the research on the dissemination of ecolabelling in the Polish public policies revealed one more interesting future challenge, i.e., scrutinizing the development of public incentives on the national, regional and local level, as well as on a macro- and microscale. The future research of this topic should be conducted also among different countries with a view to delivering instrumental knowledge for comparative tests in a international, multinational and transnational dimension.

Literature

- Andrea Blengini, G., & Shields, D. J. (2010). Green labels and sustainability reporting: Overview of the building products supply chain in Italy. *Management of Environmental Quality: An International Journal*, 21(4), 477–493. <https://doi.org/10.1108/14777831011049115>
- Castka, P., & Corbett, C. (2016). Adoption and diffusion of environmental and social standards. *International Journal of Operations & Production Management*, 36(11), 1504–1529. <https://doi.org/10.1108/IJOPM-01-2015-0037>
- Charter, M., Young, A., Kielkiewicz-Young, A., & Belmane, I. (2001). Integrated product policy (IPP) and eco-product development (EPD). *Proceedings Second International Symposium on Environmentally Conscious Design and Inverse Manufacturing*, 672–677. <https://doi.org/10.1109/ECODIM.2001.992445>
- Crnobrnja, B., Budak, I., Ilić, M., & Hodolić, J. (2009). Environmental labelling of products with type I labels. *RMZ - Materials and Geoenvironment*, 56(3), 346–355.
- Dekhili, S., & Akli, A. M. (2014). Eco-labelling brand strategy. *European Business Review*, 26(4), 305–329. <https://doi.org/10.1108/EBR-06-2013-0090>
- Directive 2005/29/EC. (2005). *Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council (Unfair Commercial Practices Directive)*. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02005L0029-20220528&from=EN>
- Directive (EU) 2019/2161. (2019). *Directive (EU) 2019/2161 of the European Parliament and of the Council of 27 November 2019 amending Council Directive 93/13/EEC and Directives 98/6/EC, 2005/29/EC and 2011/83/EU of the European Parliament and of the Council as regards the better enforcement and modernisation of Union consumer protection rules*. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L2161&from=EN>
- Domingues, A. R., Pires, S. M., Caeiro, S., & Ramos, T. B. (2015). Defining criteria and indicators for a sustainability label of local public services. *ECOLOGICAL INDICATORS*, 57, 452–464. <https://doi.org/10.1016/j.ecolind.2015.05.016>
- Dosi, C., & Moretto, M. (2001). Is Ecolabelling a Reliable Environmental Policy Measure? *Environmental and Resource Economics*, 18(1), 113–127. <https://doi.org/10.1023/A:1011101604084>

- D'Souza, C. (2000). Bridging the communication gap: Dolphin-safe "ecolabels". *Corporate Communications: An International Journal*, 5(4), 185–190. <https://doi.org/10.1108/13563280010379129>
- D'Souza, C., Taghian, M., & Lamb, P. (2006). An empirical study on the influence of environmental labels on consumers. *Corporate Communications: An International Journal*, 11(2), 162–173. <https://doi.org/10.1108/13563280610661697>
- EPA. (1993). *Evaluation of Environmental Marketing Terms in the United States* (EPA 741-R-92-003). <https://nepis.epa.gov/Exe/ZyPDF.cgi/20000U0X.PDF?Dockey=20000U0X.PDF>
- Horne, R. E. (2009). Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption. *International Journal of Consumer Studies*, 33(2), 175–182. <https://doi.org/10.1111/j.1470-6431.2009.00752.x>
- Ihemezie, E. J., Ukwuaba, I. C., & Nnaji, A. P. (2018). Impact of 'Green' Product Label Standards on Consumer Behaviour: A Systematic Review Analysis. *International Journal of Academic Research in Business and Social Sciences*, 8(9), Pages 666–684. <https://doi.org/10.6007/IJARBS/v8-i9/4647>
- ISO 14020:2000, *Environmental labels and declarations—General principles*. (2000).
- ISO/TR 14025:2000. (2000). *ISO/TR 14025:2000, Environmental labels and declarations—Type III environmental declarations—Principles and procedures*.
- Kern, K., Joergens, H., & Jaenicke, M. (2005). The Diffusion of Environmental Policy Innovations: A Contribution to the Globalisation of Environmental Policy. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.653583>
- Kireeva, I. (2012). Origin labelling in the European Union. *ERA Forum*, 12(4), 549–564. <https://doi.org/10.1007/s12027-011-0235-7>
- Klintman, M. (2016). *A Review of Public Policies relating to the Use of Environmental Labelling and Information Schemes (ELIS)* (OECD Environment Working Papers No. 105). <https://doi.org/10.1787/5jm0p34bk7hb-en>
- Maj, J., Hawrysz, L., & Bebenek, P. (2018). Determinants of Corporate Social Responsibility Disclosure in Polish Organisations. *International Journal of Contemporary Management*, 17(1), 197–215. <https://doi.org/10.4467/24498939IJCM.18.011.8390>
- Mak, H., & Crane, A. (2009). Ecolabelling: A Development Framework. In C. Campbell (Ed.), *Marketing in Transition: Scarcity, Globalism, & Sustainability Proceedings of the 2009 World Marketing Congress* (p. 140). https://doi.org/10.1007/978-3-319-18687-0_60
- Obrecht, M. (2020). Integrating Life Cycle Thinking, Ecolabels and Ecodesign Principles into Supply Chain Management. In A. Kolinski, D. Dujak, & P. Golinska-Dawson (Eds.), *Integration of Information Flow for Greening Supply Chain Management* (pp. 219–249). Springer International Publishing. https://doi.org/10.1007/978-3-030-24355-5_13
- OECD. (2016). *Environmental labelling and information schemes. Policy perspectives*. <https://www.oecd.org/env/policy-persectives-environmental-labelling-and-informati-on-schemes.pdf>
- Petty, R. D., Gray-Lee, J. W., Scammon, D. L., & Mayer, R. N. (1994). Review of Legal Standards for Environmental Marketing Claims. *Journal of Public Policy & Marketing*, 13(1), 155–159. <https://doi.org/10.1177/074391569401300114>
- Potter, S., & Hinnells, M. (1994). Analysis of the development of eco-labelling and energy labelling in the European Union. *Technology Analysis & Strategic Management*, 6(3), 317–329. <https://doi.org/10.1080/09537329408524175>

- Prag, A., Lyon, T., & Russillo, A. (2016). *Multiplication of Environmental Labelling and Information Schemes (ELIS): Implications for Environment and Trade*. <https://doi.org/10.1787/5jm0p33z27wf-en>
- Sridhar, K. (2012). Is the Triple Bottom Line a restrictive framework for non-financial reporting? *Asian Journal of Business Ethics*, 1(2), 89–121. <https://doi.org/10.1007/s13520-011-0010-4>
- TC > ISO/TC 207. (2020, September 12). *Standards by ISO/TC 207/SC 3 Environmental labelling*. <https://www.iso.org/committee/54836/x/catalogue/p/0/u/1/w/0/d/0>
- Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing*, 44 (11), 1787 - 1810, 44(11/12), 1787–1810. <https://doi.org/10.1108/03090561011079882>
- Thøgersen, J., & Nielsen, K. S. (2016). A better carbon footprint label. *Journal of Cleaner Production*, 125, 86–94. <https://doi.org/10.1016/j.jclepro.2016.03.098>
- Witek, L. (2017). Sustainable Consumption: Eco-labelling and its impact on consumer behavior - evidence from a study on Polish consumer. *Institute of Economic Research*, 142, N/A. <https://ideas.repec.org/p/pes/wpaper/2017no142.html>
- Xu, D., Karray, M. H., & Archimède, B. (2017). A semantic-based decision support platform to assist products' eco-labeling process. *Industrial Management & Data Systems*, 117(7), 1340–1361. <https://doi.org/10.1108/IMDS-09-2016-0405>
- Zybała, A. (2012). *Polityki publiczne: Doświadczenia w tworzeniu i wykonywaniu programów publicznych w Polsce i w innych krajach: Jak działa państwo, gdy zamierza (chce) musi rozwiązać zbiorowe problemy swoich obywateli?* Krajowa Szkoła Administracji Publicznej.