

Creating an Effective System of Education to Prepare Future Human Resources within the Context Provided by the Global Shift toward a “Green Economy”

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ABSTRACT

This article explores the major aspects of putting together effective national systems of education oriented toward providing academic instruction to the population and preparing future human resources for work within the economy in specific alignment with the concept of environmental responsibility (or that of “green economy”). The major conclusions drawn by the authors are:

- this period in the development of modern civilization, characterized by our aggressive and wasteful exploitation of the Earth's natural resources, nearing its end, the major condition for our civilization to be able to physically go on is the shift to a “green economy”, a new global concept that implies being oriented toward ensuring social equality and the availability of resources and education on the basis that our anthropogenic and technogenic impact on the environment will not be aggressive;
- national education and human resource preparation systems serve as a strategic basis that determines the specificity of national social-economic development. They ought to be transformed and enhanced, while working to forestall whatever catastrophic scenarios for the development of society and the economy there may be;
- the global shift from resource-wasting to resource-effective development, predicated on knowledge and its creative utilization, will be possible via the harmonization of national systems of education and their transformation, involving a shift in the focus of learning from anthropocentrism to biocentrism and ecocentrism.

KEYWORDS

“green economy”, sustainable development,
education, preparation of human resources, system
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Introduction

The world around us is changing on a consistent and ongoing basis, and these changes, distinct from each other in dynamics, essence, and content, are governed by two key groups of factors: social and scientific-technical (technological) ones. All observable human history has been shaped by scientific-technical achievements, and based on the needs of society (its individual members/representatives) (Berger & Lester, 2015; Busemeyer & Trampusch, 2012). It goes without saying that the shaping of both our historical and modern space has also had a lot to do with the activity of particular individuals in history. For instance, we are unlikely to ever find out, in detail, about the economic activity of people of antiquity, including our direct ancestors – the Cro-Magnons. But we are quite credibly knowledgeable about the motives, economics, and material status of the army led by Alexander the Great, since this historical figure has played a significant role in shaping the principles of modern knowledge in the military area. It is, in large part, the various needs of a military nature that have paved the way for the emergence of numerous modern-day technologies, a sort of spin-off with military technology finding use within the civil production and service sector (Malhotra, 2001). And until recently, it was considered quite OK for the military sector to prevail in the national economy over the civil one (in some countries, like China and North Korea, the state budget is still to this day put together in alignment with the dominant needs of the military-industrial complex).

It appears to be the need to defend and protect, and quite often attack, that has governed mankind's wasteful, irresponsible treatment of the environment. In a situation when people constantly feel they are living under some kind of threat from the outside and try to do something about it to ensure their survival, issues like being sparing of resources and less aggressive in getting them from the environment may appear to be just irrelevant and secondary. By contrast, when your domestic and foreign social-economic relations stabilize and become predictable (forecastable), you may consider boosting your standard of living (Dunleavy, 2014; Norman & Francis, 1996), something that cannot be actualized regardless of environmental context (Pearce, Markandya, & Barbier, 1997).

Boosts in human life expectancy and in the value of each and every human life, as well as declines in aggressiveness in society and in interethnic and interracial tension, appear to be, on the one hand, the consequence of wider access to primary and secondary resources, which we need in order to ensure proper economic and social development for our society. On the other hand, the historically accumulated need to constantly engage ever-newer resources in social-economic circulation leads to the depletion of our subsoil assets and greater anthropogenic and technogenic strains on the environment, increasingly maximizing the chances of a major environmental catastrophe occurring. Thus, the current situation in the global social-economic development of human civilization is characterized by structural and dynamic disproportions which are signaling the need to shift from a resource-wasting scenario to a resource-effective one, which is part of the concept of "green economy" (Pearce et al., 1997; Chapple, 2008).

A "green economy" is a new scientific, and, at the same time, practice-oriented, paradigm which, being a logical continuation of the concept of



“sustainable development”, describes the only possible scenario capable of not only ensuring the physical preservation of our present-day generations but also helping preserve the base of our future generations (including going forward and far into the future). Getting the shift to a “green economy” to actually come to pass requires a whole new set of approaches to bringing up and educating our growing generations, as well as cultivating the cognitive and professional development of people in their middle and senior years.

Methods

This article utilizes content-analysis and some of the available social, scientific-educational, and economic statistics to help gain an insight into the interrelationship between boosts in the environmental responsibility of economic agents and the social-welfare sector and the context of the change of trends within the systems of general, special, and higher education, as well as the area of career enhancement training for employees engaged in the production of economic values or servicing of market needs. The paper’s general methodological idea consists in that we cannot achieve boosts in environmental responsibility at the social and economic level without transforming the current educational paradigm first – transforming it into one that would promote the harmonious co-development of societies and ecosystems as opposed to the ruthless subjugation of nature to the needs of man.

In other words, the current, anthropocentric, model of the evolution of human civilization ought to be replaced by the philosophy of biocentrism, which is in full alignment with the concept of “green economy”, predicated on the following key postulates (Pearce et al., 1997; Chapple, 2008; UNEP, 2016):

- 1) effecting a shift from high-carbon to low-carbon energy in the economy and the social-welfare sector;
- 2) rationalizing the consumption of primary resources and utilizing recycling to ease strains on the ecosystem and obtain secondary resources;
- 3) giving up the domination of ultranationalist ideas in the governance of modern states and countries;
- 4) conserving the natural environment to provide for the needs of future generations and laying down the groundwork for their well-balanced life’s activity.

Results

Until recently, it was customary to gauge the quality of the social-economic development of national states, countries, and particular regions around the world using such simple and easy-to-understand indicators as GDP per capita, literacy levels, per capita income, etc. It goes without saying that life expectancy and literacy levels are objective indicators characterizing the quality and standard of living in various countries and regions around the world. At the same time, such economic indicators as GDP per capita or national per capita income are not perfectly informative and credibly reflective of the level of a nation’s social and economic development. Thus, for instance, if we take a look at the first 10 countries by GDP per capita (Table 1), atop the table is Qatar, with an average expected lifespan of 78.2 years and a Human Development Index of 0.850.

Table 1. Key social-economic parameters of the development of countries leading the way in GDP per capita (as of 2014–2015). (Mishra & Nathan, 2013; International Monetary Fund, 2015; New Economics Foundation, 2014)

Rank	Country	GDP per capita, US dollars/person	Human Development Index	Average expected lifespan, years
1	Qatar	132,099	0.850	78.2
2	Luxembourg	98,987	0.892	82.2
3	Singapore	85,253	0.912	83.1
4	Brunei	79,587	0.856	77.7
5	Kuwait	70,166	0.816	77.1
6	Norway	68,430	0.944	81.8
7	United Arab Emirates	67,617	0.835	77.1
8	Switzerland	58,551	0.930	83.1
9	USA	55,805	0.915	79.3
10	Ireland	55,533	0.959	81.4

To compare, Ireland (ranked 10th) has the highest Human Development Index (0.959) among the countries listed in Table 1, while Switzerland (8th) leads the way in average expected lifespan (over 83 years).

It is obvious that the traditional indicator GDP per capita is not sufficiently informative. In the same vein, indicators similar to the Human Development Index are often criticized for logical imbalance and lack of assessment of the environment. For this reason, in the last decade attempts have been made to come up with indexes most fully reflecting the quality and standard of living and the population's overall state and condition in various countries of the world. In 2016, it was proposed to use the so-called Happy Planet Index, which seems to be the more sensible yardstick in our case – not all people aspire to wealth, but everyone wants to live a long and healthy life. We can do some comparing by taking a look at the above top 10 countries by GDP per capita as ranked by the Happy Planet Index (Figure 1).

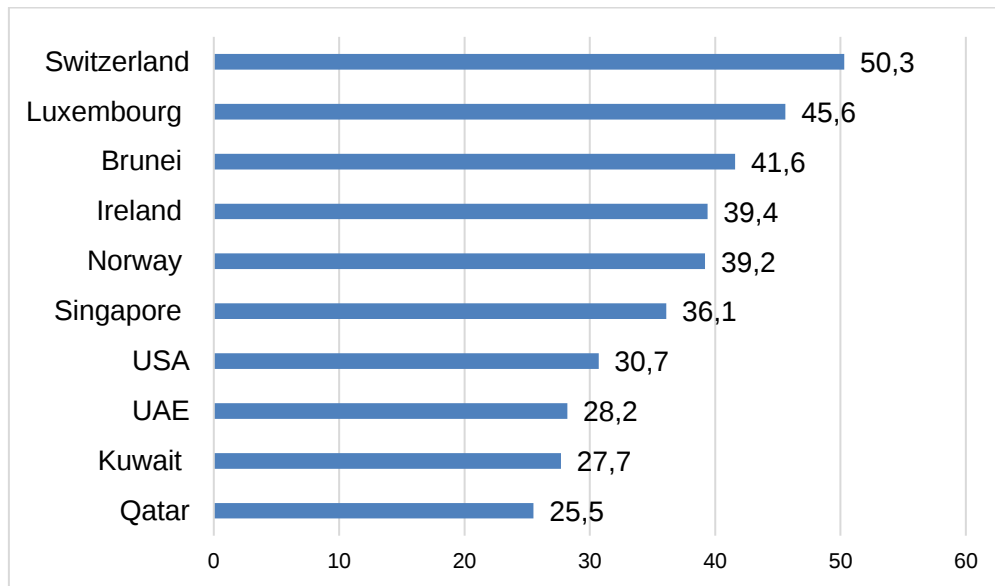


Figure 1. Top 10 countries in GDP per capita as ranked by the Happy Planet Index (as of 2012–2013). (Mishra & Nathan, 2013; International Monetary Fund, 2015; New Economics Foundation, 2014)

The above data indicate that enjoying undisputed leadership are now Switzerland and Luxembourg, although these two do not have the highest GDP per capita. Sitting atop these rankings is Costa Rica with a Happy Planet Index score of 64. This country ranks its well-being at 7.3 out of ten, compared with Switzerland's 7.5, but its ecological footprint appears to be lower – 2.5 versus Switzerland's 5. To note, the countries under review have posted pretty high literacy levels: 93 to 99% (Figure 2).

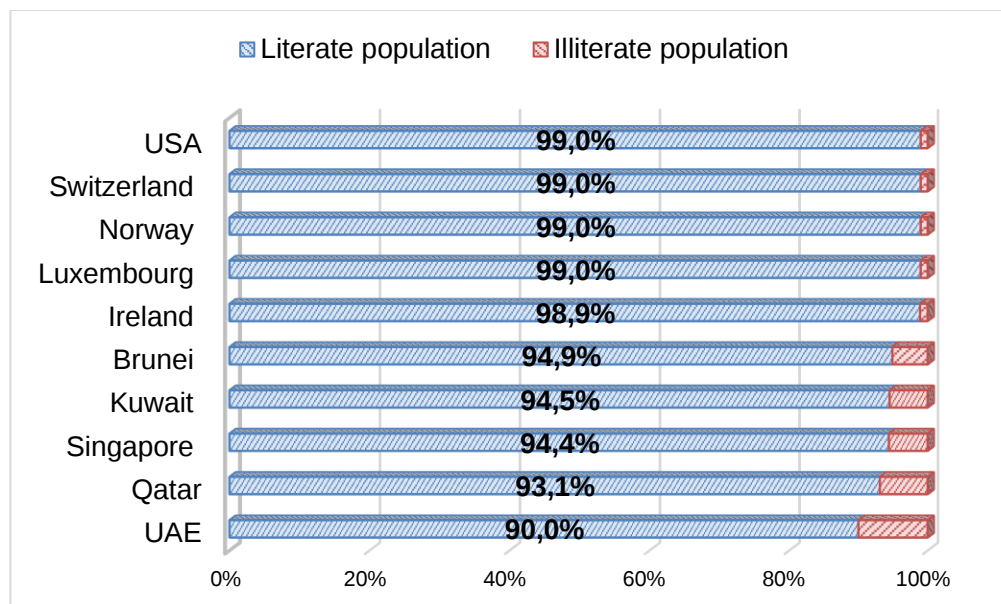


Figure 2. Top 10 countries in GDP per capita as ranked by literacy level (as of 2013–2014). (Mishra & Nathan, 2013; International Monetary Fund, 2015; New Economics Foundation, 2014)

An exception is the United Arab Emirates, with a literacy rate of no more than 90%. As for qualitative indicators for the national systems of education, it is observed that among the 10 top countries leading in GDP per capita leading positions in the world education rankings are held only by the US (ranked 5th), Ireland (6th), and Norway (3rd) (Figure 3).

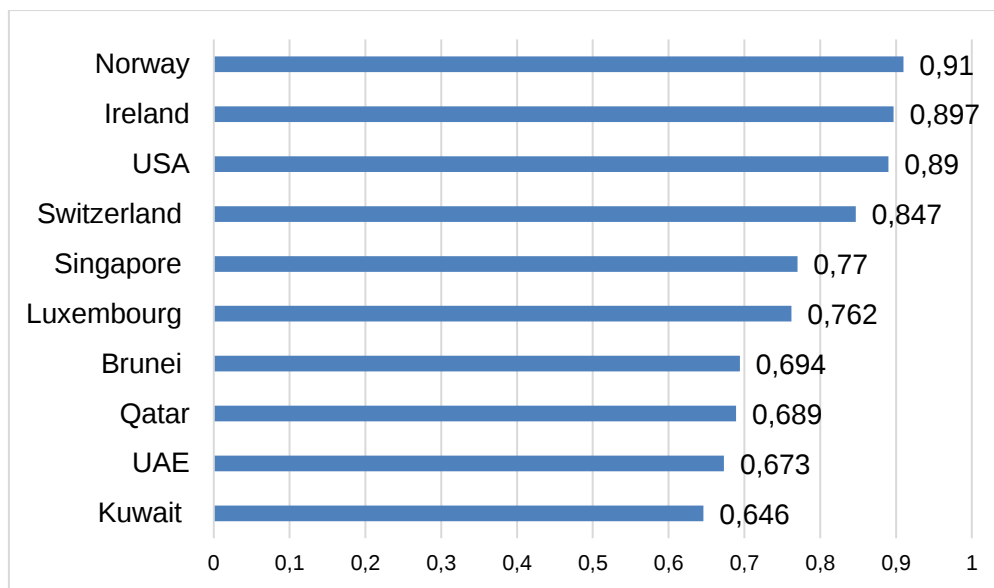


Figure 3. Top 10 countries in GDP per capita as ranked by education level (as of 2014–2015). (Mishra & Nathan, 2013; International Monetary Fund, 2015; New Economics Foundation, 2014)

As for the rest of these countries, 4 of them, namely Qatar, Kuwait, Brunei, and the United Arab Emirates, which generate most of their state revenue from oil sales, are ranking low in this respect (73rd, 94th, 71st, and 79th, respectively, among a total of 187 countries). The above statistics let us draw 2 major conclusions:

- firstly, the intellectual development of a nation does not depend on whether it generates significant revenue but is governed, rather, by how well this revenue is researched by that nation;
- secondly, economic indicators do not characterize the quality of the social-economic development of nations, and posting high per capita income figures does not guarantee the quality of the national ecosystem; e.g., we may rejoice at the high quality of water resources in the US, Switzerland, and Ireland but, at the same time, worry about the steadily high carbon dioxide levels posted by the very US and the United Arab Emirates.

Furthermore, the ability to generate significant revenue does not guarantee an extensive social safety net, as is the case in some of the countries of the



Middle East, where most of the revenue from oil and hydrocarbon resource sales is pocketed by members of the ruling monarchical families, who not only hold most of the top government positions but own all of the nation's subsoil assets and natural resources. Thus, it is quite obvious that the shift to a "green economy" is possible only provided that national revenue is invested in human capital and the development of socially critical infrastructure, science, and education.

Discussion

In 2010, Henry Etzkowitz, suggested that the scientific community reconsider the way to construct, structure, and manage social-economic processes under present-day conditions (Etzkowitz, 2010; Fücks, 2016; Dudin, Frolova, Gryzunova, & Shuvalova, 2015). This scientific approach is known today as the Triple Helix model, which views the state, scientific-educational sector, and business environment as equal partners and holds that:

- a) the state is expected to create the conditions for sound social-political development, which, among other things, ought to be in keeping with the concept of "sustainable development" and that of "green economy" (akin to an innovation economy, cognitive economy, or knowledge economy);
- b) the scientific-educational sector is expected to perform the preparation of human resources and ensure the generation of scientific-technical ideas conducive to sound economic growth and social development;
- c) the business environment is expected to make active use of scientific-technical ideas supplied by the scientific-educational sector to create new jobs and new products and services, which will translate into sustainable gains in human and production capital and commitment to the rational use of natural resources.

As uncomplicated and down-to-earth as it may appear, the idea propounded by Henry Etzkowitz does a perfect job reflecting the essence of the interrelationships between the three key actors (the state, scientific-educational sector, and business environment). Having said that, not all modern states seem aspiring to create the conditions for science, education, and business to start interacting in an active manner to ensure greater gains not only for large business establishments, the state, and particular entrepreneurs, reaping massive profits as it is (comparable at times to national budget revenue), but for society as a whole, inclusive of all its classes and strata, as well. The active interaction between science, education, and business implies:

- firstly, the formation of institutions mediating and fostering this interaction, which is expected to be taking place between the state, society, and business within the framework of a harmonious rule-of-law space;
- secondly, boosts in the nation's human capital and gains in its intellectual and knowledge-based potential, translating into useful research and innovation;
- thirdly, the development of all relevant infrastructure (economic, social, scientific-educational, engineering, and energy-related);

• fourthly, the active development of domestic markets and business, with much of a nation’s business orienting toward a high-tech service, retail, and production sector.

These four aspects determine the pace of a nation’s economic growth, its social development level, and its competitiveness in foreign markets (V. Ignatovich & S. Ignatovich, 2014; Shehzad, Fareed, Zulfiqar, Shahzad, & Latif, 2014). And they are the ones laid down in the foundations of the yearly Global Innovation Index. The index, additionally, reflects the development level of a nation’s economy and the degree of efficiency of its scientific-technical creative efforts. In other words, the index can be viewed as an indicator of the quality of a nation’s social-economic development, while it can also be viewed as an indicator of the caliber and effectiveness of its national system of education, for it is education and science that Etzkowitz’s Triple Helix model treats as its primary driving force.

When it comes to the positions of the top 10 countries in GDP per capita in the Global Innovation Index rankings, leading the way are countries known to follow democratic state governance principles, which manage to either utilize most efficiently their resource rent, by investing it in sustainable development and transforming their industrial economy into a “green” one, or do their human capital – which helps maximize national revenue and achieve relatively even distribution of social-economic gains across the population (Figure 4).

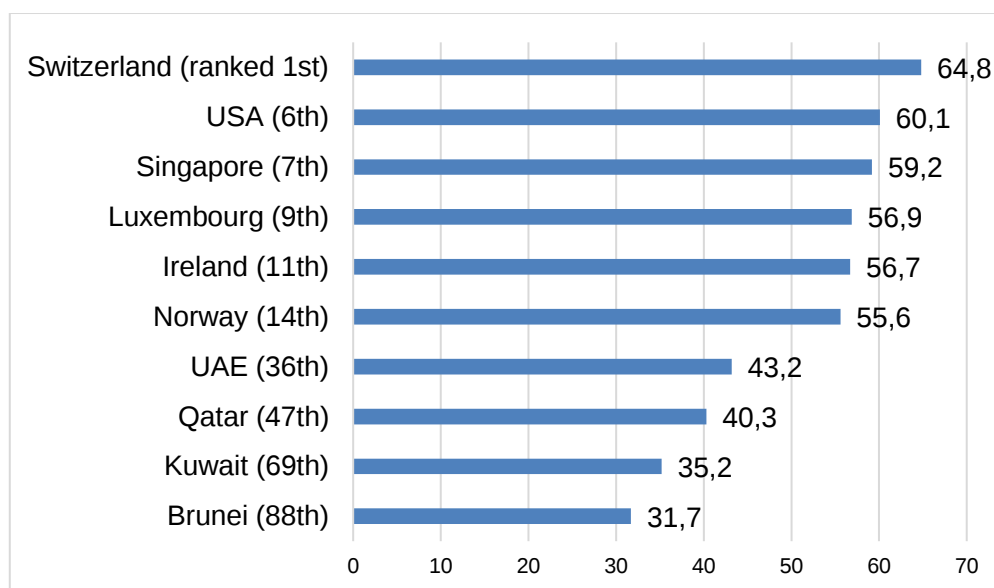


Figure 4. Top 10 countries in GDP per capita as ranked by the Global Innovation Index (as of 2015–2016). (Global Innovation Index, 2015)

The above statistics let us draw the following conclusions:

• firstly, the shift from a resource-wasting scenario to a resource-effective one cannot be possible without transforming the national systems of education and harmonizing them at the global level;



- secondly, it is especially worth noting that a democratic state creates more opportunities for the active interaction of business, science, and education, which helps it transform its natural resource rent into knowledge resource rent and thus maximize its national revenue;

- thirdly, strategically the system of education ought to be oriented not toward the concept of anthropocentrism but that of biocentrism and promote the belief that environmental conservation is the only possible way to preserve our civilization and that everyone ought to structure their life's activity in keeping with the ethics of environmental responsibility.

Thus, it is obvious that the shift to a “green economy” is not possible without changes in the national education and human resource preparation systems. These changes are needed in order for nations to tap into a new source of national rent – knowledge-based or cognitive rent, which, compared with its natural (resource) counterpart is inexhaustible, and exploiting it intensely does not lead to the exhaustion of subsoil assets and environmental imbalance – provided that the use of knowledge-based (cognitive) rent is aimed not at engaging in destructive and aggressive activity but at cultivating good neighborly relations with other countries (Davies, 2013; Tokuhama-Espinosa, 2015).

Reforming the national education and human resource training/retraining systems ought to include focusing on the following key aspects:

- 1) the underlying idea, essence, use, goals and objectives of the shift from a resource-wasting scenario for the operation of the economy and social-welfare sector to an environmentally responsible one;
- 2) the place of “green” (environmentally safe) technology within the resource-saving and resource-effective model for national social-economic development;
- 3) key theoretical, methodological, and practice-oriented approaches aimed at minimizing environmental costs, as well as production losses, and reducing energy intensity in the industrial sector;
- 4) the interrelationship between the concepts of “social” and “environmental responsibility” and academic management-related and economic disciplines, as well as the actual practice of managing the operation and development of business entities within the national economy.

Thus, the national education and training/retraining systems, preparing human resources for the various types of economic activity, appear to be a crucial strategic component in ensuring a seamless shift for the national social-economic system from resource-wasting and ineffective models for development to sustainable and environmentally safe ones (Breier, Letseka, Cosser, & Visser, 2014; Dmitrenko, Lavrik, & Yares'ko, 2015; Dudin, Sepiashvili, Smirnova, Frolova, & Voykova, 2015). It is also worth noting that national education systems ought to actively interact with each other, for only sound scientific and social interaction can ensure the global shift from catastrophe-fraught models for development to sustainable ones. National states ought to be interested in their population being able to actively develop intellectually and cognitively and

aspire to use knowledge acquired through education in practice (Blundell, Dearden, Meghir, & Sianesi, 1999; Lin & Edvinsson, 2010).

This will also facilitate boosts in entrepreneurial activity oriented toward operating within the high-tech segments of the economy. Without promoting environmentally responsible and innovation-minded entrepreneurship it is also impossible to build a “green” national economy.

Conclusions

The caliber of the national system of education is what determines, in large part, the major dimensions and specificity of the social-economic development of nations. The resource-based era in the development of mankind coming to an end, we are standing at the threshold of a new – intellectual-cognitive – era, its central postulates holding that:

- mankind ought to renounce, once and for all, its aggressive and wasteful approach to the use of natural resources;
- the development of the economic sector ought to be socially and environmentally responsible; the social-welfare sector ought to operate in a such a way as to minimize technogenic and anthropogenic strains on the environment;
- knowledge and the ability to transform it into tangible and intangible values will be a sustainable competitive advantage not only for particular individuals and social groups but for national states as a whole;
- sustainable national social-economic development is governed not by large-scale investment in the military-industrial complex, army, and defense industry but investment in the development of education, healthcare, and socially critical infrastructure;
- the state of the national system of education can be regarded as a qualitative indicator of the specificity of the country’s social-economic development; the higher the quality of education and the more accessible it is, the swifter the national shift from a wasteful economy to a “green” one.

Thus, the creation of effective, quality-oriented national systems of education capable of providing society with necessary, relevant, and advanced knowledge and the economy with sustainable pools of highly qualified human resources may expedite, both nationally and globally, the big shift to a “green economy” and environmentally responsible life’s activity.

Among some of the crucial issues left out of consideration in this paper are:

- a) methods for assessing the state and quality of national education and human resource preparation systems;
- b) ways to assess the needs of the national economy as a whole or any of its particular sectors in the way of human resources possessing a set of sought-after professional competencies;
- c) methodological and practical approaches to fostering environmentally responsible competencies when providing academic instruction to people as part of general, vocational, or higher education.

The authors intend to get further insight into, as well as further elaborate and develop, these and some other aspects of putting together effective national education and human resource preparation systems (within the context of the



shift toward a “green economy”) in their future research projects on the subject and similar ones.

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