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Green Jobs in Vinnytsia City Territorial Community

Policy Paper

Vinnytsia, 2024



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Information and opinions in this paper are those of the authors and do not necessarily reflect the position of the by Konrad-Adenauer-Stiftung.

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Abbreviations

CO - Classifier of occupations of Ukraine

CTC - City Territorial Community

GJs - green jobs

HEI - higher education institution

IDC - Vinnytsia CTC Integrated Development Concept 2030

ILO - International Labor Organization

OECD - Organization for Economic Cooperation and Development

TEA - type(s) of economic activity

USEDDB - Unified State Education Database

V(VT)EI - Vocational (vocational and technical) education institution

List of tables

Table 1. Green jobs in Vinnytsia CTC, by type of economic activity.....	26
Table 2. Main TEA in the market services group by the number of green jobs.....	27
Table 3. Green jobs in certain types of activities in the processing industry.....	27
Table 4. Green jobs in the «Professionals» group.....	29
Table 5. Green jobs in the «Specialists» group.....	29
Table 6. Green jobs in the «Skilled workers with tools» group.....	29
Table 7. The most popular professions for green jobs.....	30
Table 8. Number of graduates by field of study (2023).....	31
Table 9. Recipients of vocational education by profession (2024).....	32
Table 10. Green jobs in some European cities.....	39
Table 11. Examples of professional development programs in new professions.....	40

Table of Contents

Abbreviations	4
List of tables	5
Introduction	8
Understanding of green jobs and their importance for the community.....	8
About this study.....	9
Research Methodology	10
Estimating the number of green jobs	11
Survey of utility companies	11
Education system	12
I. Socio-Economic Development of Vinnytsia CTC	13
1.1 Vinnytsia profile	14
1.2 Development plans for Vinnytsia CTC	20
II. Green jobs in Vinnytsia CTC	24
2.1 Assessment of the current situation (by type of economic activity)	25
2.2 Assessment of the current situation (by professional composition)	28
2.3 Education for green jobs	31
2.4 Specifics of the utilities sector	33
III. European experience	35
3.1 Successful practices of the European cities	36
3.2 Growth of careers in sustainable development	39
3.3 Green skills	40
IV. Conclusions and Recommendations	41

Introduction

Understanding of green jobs and their importance for the community

The transition to sustainable development and green climate transformation have led to the emergence of the concept of «green jobs».

According to the International Labor Organization (ILO), green jobs are a new type of jobs that play a vital role in the greening of businesses and economies, and their definition and measurement are important for understanding the relationship between environmental sustainability and labor markets. Among the consequences of this relationship are the creation of new types of jobs, phasing out of some existing («old») jobs, and the change and acquisition of new skills for many jobs in the economy, which will require upskilling and retraining of workers¹.

Green jobs can be understood from two perspectives:

- jobs created in green sectors of the economy (e.g., renewable energy or waste management), or
- jobs where the employee performs certain tasks that contribute to environmental or climate protection regardless of the core business of the enterprise (for example, an air quality engineer at a coal-fired power plant).

Under the first approach, the focus is on goods (or services) the company produces (provides). In the European Union, these are called environmental goods and services. Accordingly, all jobs required for their production are considered green jobs (including such professions as accountants and lawyers). However, in practical terms, the vast majority of enterprises produce both environmental and other products. This creates significant difficulties in determining which jobs should be considered green at such enterprises.

Under the second approach, the focus is on the profession (position) a particular employee holds and job responsibilities such a position includes. Consequently, this approach is close to the concept of green professions. According to this approach (which is common in the United States, for example), the focus is on what an employee does, instead of on the business of the enterprise. Consequently, not all jobs at a waste processing plant would be considered green. Instead, as long as employees of an «grey» enterprise are involved in environmental issues, their jobs are considered green (often partially).

In addition, according to the International Labor Organization, «decent work» is an integral component of the concept of green jobs.

Why is it important for the territorial community?

Implementation of local development plans of Vinnytsia community, such as the city's Green Deal, will inevitably rely on a skilled workforce. As a result, the local labor market will change.

In turn, the greening of the local labor market affects people, communities, and businesses². The green transition will create new (green) jobs, phasing out some old ones, and, most importantly, require new knowledge and skills from employees. The new knowledge and skills must meet the requirements of green jobs that will inevitably arise in the process of implementing community green development plans.

The demographic crisis caused by Russian aggression will increase competition between communities and businesses in the labor market in the region and the country. Communities that have a clear strategy

¹ Green Jobs and the Postwar Reconstruction of Ukraine. Policy brief. In: Andrushevych A., Andrushevych N., Kozak Z., Ptashnyk I., Romanko S. «Razom We Stand» & «Society and Environment», (2023).

² OECD (2023), Job Creation and Local Economic Development 2023: Bridging the Great Green Divide, OECD Publishing, Paris, <https://doi.org/10.1787/21db61c1-en>.

for creating and maintaining green jobs will facilitate the return of people and prevent migration. Such communities will offer modern, decent and competitive jobs, and on the other hand, provide businesses with access to employees with the appropriate qualifications.

Creating green jobs is not an end in itself. It is a necessary condition and consequence of the green transformation of the country and the community. A proper understanding of the current and future labor market in the community is an important condition for strategic planning and management in this area. Only community that understands and knows its green jobs market can become a leader in local development, attract investment and promote the development of promising industries in line with its own vision of the future.

About this study

The policy paper was prepared by the team of the Resource and Analytical Center «Society and Environment» (Andriy Andrusevich, Nataliya Andrusevych, Zoryana Kozak), NGO «Razom we Stand» as part of the implementation of the research project «Green jobs in Vinnytsia. State of play and perspectives.», with financial support by Konrad-Adenauer-Stiftung Foundation Office in Ukraine.

The project team would like to thank the City Council of Vinnytsia for their comments and suggestions, as well as Serhiy Prytomanov (Institute of Professional Qualifications) for help with data collection and data processing.



Research Methodology



Estimating the number of green jobs

The number of green jobs was estimated using the authors' methodology. The methodology is based on the O*NET database³, which contains hundreds of standardized descriptors for nearly 1000 occupations covering the entire US economy. The O*NET methodology was adapted to ILO classified occupations by OECD experts and reflected in the OECD working paper titled «The green side of productivity: An international classification of green and brown occupations».⁴ For the purposes of this study, the results of their work on cross-walking the greenness measures of jobs (occupations) from the 8-level SOC classification to the 4-level (most detailed level) ISCO-08 classification were used. As a result, the authors obtained Greenness scores for each of the professions that include at least one green job (task) according to the Classifier of Occupations of Ukraine. The developed methodology contains Greenness scores for each profession that includes at least one green job (duties, tasks).

As a result, a table with a list of «green» professions according to the Classifier of Occupations (CO) of Ukraine⁵ and their «greenness» scores was obtained. For the purposes of the assessment, two scores were used that are most relevant to the subject of the study - the number of green jobs by weight share in the 8-digit occupational classification system (share_green_8d according to the OECD methodology) and the intensity of green jobs, or the degree of their «greenness» (greenness according

to the OECD methodology). The full list includes 93 green professions. In turn, the application of these two scores allowed us to calculate the following two indicators:

- (1) the number and share of green jobs;
- (2) the greenness of such green jobs (in both cases, by type of economic activity, occupation, and gender).

All calculations were made using anonymized data provided by the Pension Fund of Ukraine for all employees in the municipalities of Vinnytsia City Territorial Community as of January 1, 2024:

- Vinnytsia, the administrative center of the community,
- Desna settlement,
- 7 rural settlements in 3 starosta districts, namely:
 - Vinnytsia-Khutury starosta district with the administrative center in Velyki Krushlitsi and Vinnytski Khutory villages, which covers the territories of Vinnytski Khutory, Pysarivka and Shchitky villages;
 - Stadnytsia starosta district with the administrative center in Stadnytsia village, which covers the territories of Stadnytsia, Velyki Krushlitsi, Mali Krushlitsi and Havryshivka villages;
 - Desna starosta district with the administrative center in Desna.

Survey of utility companies

The opinion of utility companies on the current state and prospects of their activities, as well as an assessment of the personnel and training needs of enterprises and their prospects has become a separate tool of the study.

In March-April 2024, a survey of municipal enterprises of Vinnytsia city territorial community was conducted by means of a questionnaire. The survey was held to investigate the current situation with jobs (including in such sectors as renewable

³ https://www.onetcenter.org/dictionary/22.0/excel/green_occupations.html

⁴ Scholl, N., S. Turban and P. Gal (2023), «The green side of productivity: An international classification of green and brown occupations», OECD Productivity Working Papers, No. 33, OECD Publishing, Paris, <https://doi.org/10.1787/a363530f-en>.

⁵ <https://www.me.gov.ua/Profession/List?lang=uk-UA&id=d4162ef8-2771-4ac5-99ef-1d4b6f5336af&tag=KlasifikatorProfesii-Poshuk>

energy, energy and energy efficiency, electric transport, waste management, water supply and sewerage, recycling, environmental protection and environmental management, green tourism, etc.).

40 utilities took part in the survey out of 53. The respondents performed the following types of economic activities:

- 'Supply of electricity, gas, steam and air conditioning (D)'. Namely, supply of steam, hot water and conditioned air;
- 'Water supply; sewerage, waste management (E)'. Namely, collection of non-hazardous waste;
- 'Wholesale and retail trade; repair of motor vehicles and motorcycles (G)'. Namely, retail sale of pharmaceuticals in specialized stores;
- 'Transportation, warehousing, postal and courier activities (H)'. In particular, urban and suburban passenger land transport; auxiliary services for land transport; auxiliary services for air transport; other auxiliary activities in the transport sector;
- 'Temporary accommodation and catering (I)'. Namely, deliveries of prepared meals not elsewhere classified;
- 'Information and telecommunications (J)'. Namely, production of cinema and video films, television programs; demonstration of films; activities in the field of radio broadcasting;
- 'Financial and insurance activities (K)'. In particular, cash intermediation not elsewhere classified;
- 'Real estate transactions (L)'. Namely, the leasing and operation of own or leased real estate;
- 'Professional, research and technical activities (M)'. Namely, activities in the field of architecture, engineering, geology and geodesy, provision of technical consulting services therein; research and experimental development in the field of social sciences and humanities;
- 'Administrative and support services (N)'. Namely, the provision of reservation services not elsewhere classified and related activities; comprehensive property maintenance;
- 'Public administration and defense; compulsory social insurance (O)'. Namely, general public administration; regulation in the areas of healthcare, education, culture, and other social spheres, except for compulsory social insurance;
- 'Education (P)'. In particular, education in the field of culture;
- 'Health care and social assistance (Q)'. Namely, the activities of hospitals, general medical practice;
- 'Arts, sports, entertainment and recreation (R)'. Namely, activities related to supporting theatrical and concert events; operation of libraries and archives, museums; other sports activities; operation of amusement and theme parks;
- 'Provision of other types of services (S)'. Namely, organizing burials and providing related services.

Education system

The analysis was carried out using data on all educational institutions located in Vinnytsia CTC according to open data from the Unified State Education Database (USEDDB)⁶.

⁶ <https://registry.edbo.gov.ua/opendata/>



Section I.
**Socio-Economic
Development of
Vinnytsia CTC**

The Vinnytsia City Territorial Community brings together communities of the regional administrative center and several adjacent communities. The community is represented by a wide range of economic activities, the vast majority of which are concentrated in Vinnytsia.

Vinnytsia CTC works regularly on community development planning. It is the first and only community in Ukraine to declare a local Vinnytsia Green Deal. The strategic development of the community is guided by the goals of achieving a green transition and climate neutrality.

Vinnytsia profile

Vinnytsia CTC⁷ consists of the city of Vinnytsia (the administrative center of the CTC), Desna settlement and 7 rural settlements comprising 3 starosta districts (Vinnytsia-Khutirskyi, Stadnytskyi and Desnianskyi).

Vinnytsia CTC covers an area of 255.45 km², where 1,884.9 hectares are forests, 10,944.7 hectares are agricultural land (including 9,243.2 hectares of arable land, 571.5 hectares of perennial plantations, 334.8 hectares of hayfields, 639.3 hectares of pastures, 0.4 hectares of fallow land, and 155.5 hectares of land under agricultural and other outbuildings and yards).

As of 01.01.2024, the total population registered in Vinnytsia CTC is 356 700 people, including: 338 500 people of urban population (Vinnytsia city and Desna settlement) and 18 200 people of rural population.

Age structure of the population: people of working age – 209 300 (58.7%), people of retirement age (60+) – 87 200 (24.4%), children and youth under 18 – 60 200 (16.9%). Gender structure of the population: women – 195 700 (54.9%), men – 161 100 (45.1%). The number of IDPs who moved to Vinnytsia city territorial community from the territories of active hostilities since the beginning of

the full-scale aggression of the Russian Federation, as well as since 2014 amounted to 46,120 people as of 01.01.2024.

As of January 1, 2024, the total number of business entities⁸ is 52,802: individual entrepreneurs - 31,703, legal entities - 21,099.

In 2023, there was a positive trend in the number of business entities operating in the Vinnytsia CTC. Thus, the number of legal entities increased by 3.2%, and the number of individual entrepreneurs - by 7.4%. The trend towards an increase in the number of registered entities has been maintained over the past 4 years - the number of legal entities increased by 12.1%, and the number of individual entrepreneurs - by 18.1% compared to 2020.

Since the beginning of the full-scale war in 2022, Vinnytsia City Territorial Community has hosted 358 relocated businesses, which have created 1 746 new jobs. The relocated businesses are represented by entities from various industries, including trade, vehicle and motorcycle repair, processing and light industry, etc.

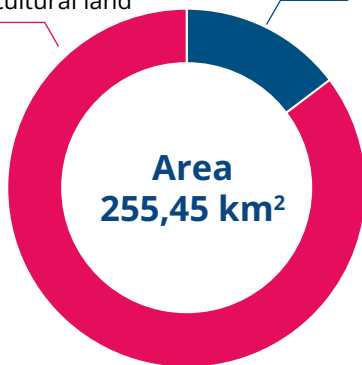
⁷ As of 01.10.2023, information from the Program of Economic and Social Development of Vinnytsia City Territorial Community 2024, approved by the Decision of Vinnytsia City Council No. 2008 of 22.12.2023, link

⁸ Business entities that are registered with the Vinnytsia State Tax Inspectorate of the Main Department of the State Tax Service in Vinnytsia Oblast (Vinnytsia).

Vinnytsia City Territorial Community



10 944,7 ha – agricultural land
1 884,9 ha – forests



- 9 243,2 ha arable land
- 639,3 ha pastures
- 571,5 ha perennial plantations
- 334,8 ha hayfields
- 155,5 ha land under agricultural and other outbuildings and yards
- 0,4 ha fallow land

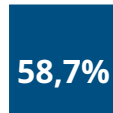
Population



356 700
persons*

urban population

rural population



people of working age

54,9%
women



people of retirement age (60+)

45,1%
men



children and youth under 18

How the war affected Vinnytsia CTC



46 120
IDPs*



358
relocated businesses



1 746
new jobs

Business entities



52 802
business entities*

individual entrepreneurs

legal entities

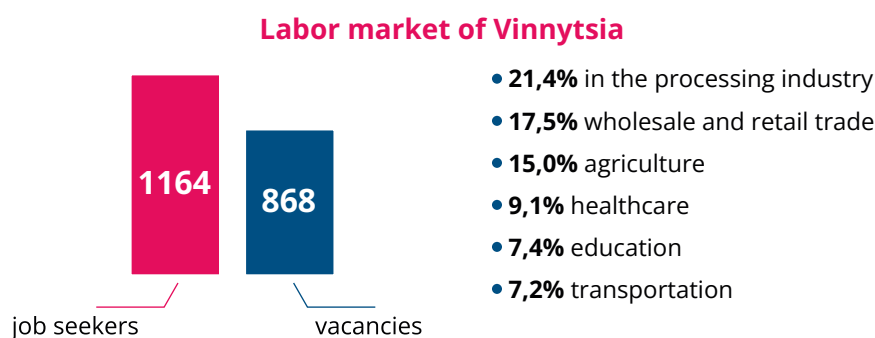


* As of January 1, 2024

Labor market

As of April 1, 2024, 1 664 job seekers were registered with the Vinnytsia branch of the State Employment Service, while the total number of available vacancies was 868 (including 607 in the Vinnytsia CTC). In terms of economic activity, most vacancies in the region are in the processing industry (21.4%), wholesale and retail trade (17.5%), agriculture (15.0%), healthcare (9.1%), education (7.4%), and transportation (7.2%).⁹ In general, women significantly outnumber men among the unemployed in the region – 4 324 women versus 966 men.

Among the surveyed enterprises of Vinnytsia City Territorial Community, about one half is experiencing a shortage of employees. Enterprises need specialists who have an understanding and knowledge of modern urban landscaping practices, tree management, application of nature-based solutions, qualified green workers, engineers, music teachers, mechanics, drivers (tram, trolleybus, bus), electromechanics, electrical engineers, machine operators, loaders.



Industrial sector

The industrial sector of Vinnytsia CTC represents more than 300 large and medium-sized enterprises of the main tier. The operations of industrial enterprises are concentrated in the processing industry (76.7% of enterprises), 43.3% of which are engaged in the production and sale of food products.

food industry enterprises¹⁰, light industry, chemical and pharmaceutical industry, energy and energy engineering, and packaging. The number of IT companies is also growing (Vinnytsia ranks 6th among all Ukrainian cities in terms of the number of IT specialists). Over the past few years, private and public spaces have started operating, and the demand is growing, i.e. Artynov Creative Space, iHub Vinnytsia, Square Vinnytsia Regional Youth Center, Cherdak, Startup School VNTU Sikorsky Challenge.

The largest industrial enterprises of the community are wood processing and wood products manufacturing companies, machine building and

Industrial sector of Vinnytsia CTC



more than
300
enterprises

- wood processing and wood products manufacturing companies
- machine building and food industry enterprises
- light industry
- chemical and pharmaceutical industry
- energy and energy engineering
- packaging

⁹ According to the SES.

¹⁰ In 2023, the industry's sales amounted to UAH 16.4 billion, which is 43.3% of all products sold.

Trade

The domestic trade, restaurant and service industries play a significant role in shaping the overall economic potential of the community. In 2023, there were 2,581 enterprises with retail trade as their core business (excluding trade volumes of individual entrepreneurs working in retail).

Agricultural sector

The agricultural sector of Vinnytsia CTC is represented by agricultural enterprises, farms and private households engaged in the cultivation of grain, industrial and oilseeds, vegetable growing, horticulture, cattle breeding, pig breeding, sheep breeding, poultry farming, fish farming and beekeeping. Crop production ranks first, while livestock production is second. The agricultural

sector involves 13 agricultural companies, 22 farms, and almost 9 500 individual farms. Local farmers specialize in growing cereals and industrial crops (wheat, barley, soybeans, sunflower, corn, rapeseed), potatoes, vegetables, and fruit and berry crops. In 2023, local farmers sold their agricultural products mainly on the domestic market.

Agricultural sector of Vinnytsia CTC



1 place
Crop production

13 agricultural companies

22 farms



2 place
Livestock production

9 500 individual farms

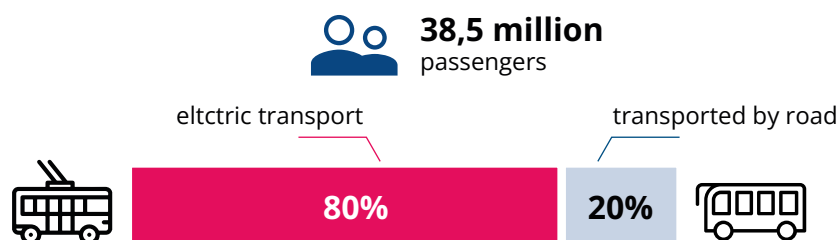
Transportation

Vinnytsia Transport Company is the main passenger carrier in Vinnytsia. It is a municipal enterprise supporting the following operations:

- 6 tram routes (served by 64 trams),
- 21 trolleybus routes (served by 115 trolleybuses, including 17 VinLine off-the grid capable trolleybuses),
- 20 public bus routes providing regular service (served by 61 low-floor buses).

38.5 million passengers were transported by all types of passenger transport operated by the Vinnytsia Transport Company¹¹ (18.2% more than in 2022). Electric transport accounted for 80% of the total transportation volume. Its services were used by 30.8 million passengers (17.7% more than in 2022). The number of passengers transported by road amounted to 7.7 million passengers.

Vinnytsia public transport in 2023

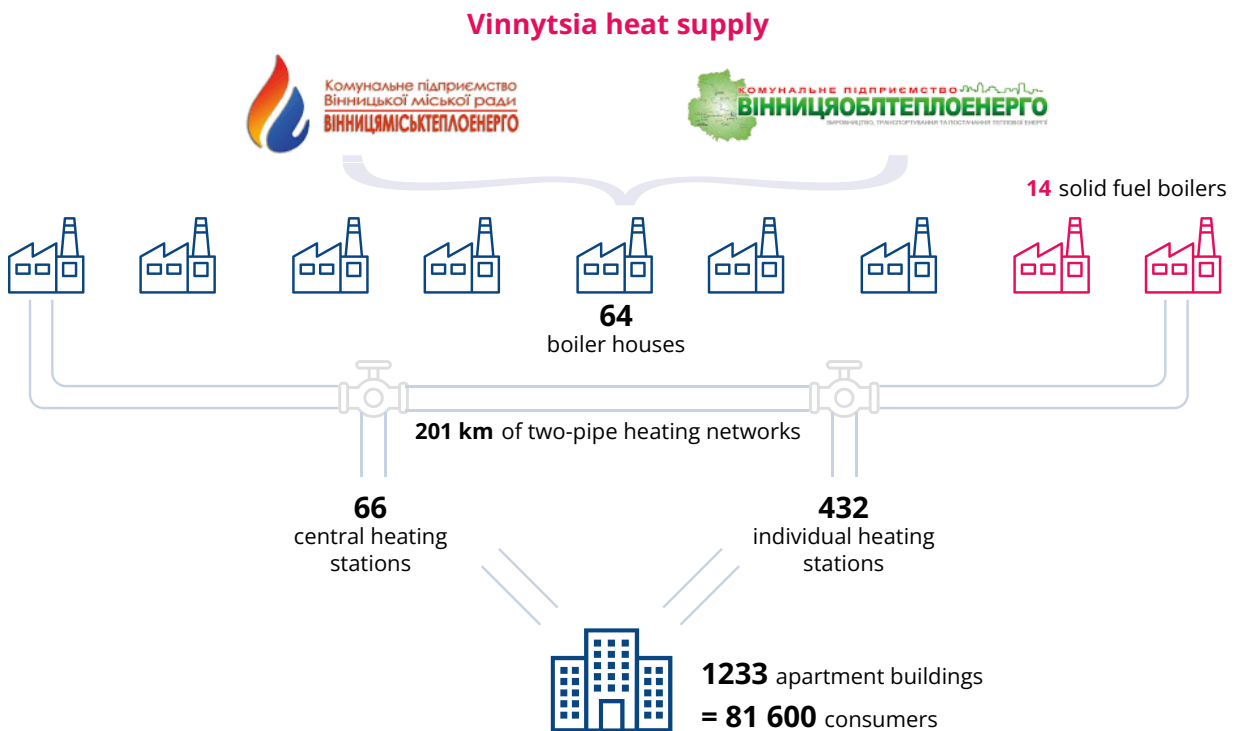


¹¹ Data for 9 months of 2023, without private carriers.

Heat supply and water disposal

Vinnysiamiskteploenergo and Vinnytsiaoblteploenergo utility companies provide district heating services for individual consumers and enterprises in Vinnytsia CTC. They operate 64 boiler houses (14 solid fuel boilers), 201 km of two-pipe heating networks, 66 central heating stations and 432 individual heating stations. The district heating networks are connected to 1,233 apartment buildings, 81,600 consumers receive heat supply services, and about half of them receive centralized hot water supply services.

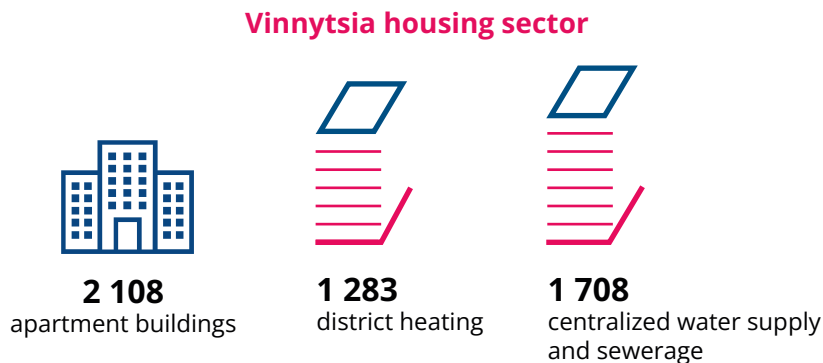
Centralized water supply and sewerage services are provided by Vinnytsiaoblvodokanal, which has 635 km of water supply and 559 km of sewerage networks, 26 water supply and 26 sewerage pumping stations, two water treatment plants, one sewerage treatment plant, and 5 drinking water wells. The company provides centralized water supply services to 364,000 customers and sewerage services to 357,850 customers.



The housing sector

The housing sector in Vinnytsia has 2,108 apartment buildings, of which 1,283 are equipped with district heating and 1,708 with centralized water supply and sewerage. In 2023, energy saving measures were carried out in 418 apartment buildings, including

the repair of power supply systems in 42 buildings, replacement of windows/doors in common use areas in 368 buildings, and repair of panel joints in 8 buildings. Overhaul of 5 waste container sites was carried out as well.



Natural resources

The hydrological network of Vinnytsia is represented by the Pivdennyi Buh River and three small rivers: Tyazhlyivka, Vyshnia, and Vinnychka. The network of rivers and streams in the city is quite dense (1.05 km/km²). There are 0.77 km of rivers per 1 km² of area. The Pivdennyi Buh river is the main river of Vinnytsia with a total length of 806 km, including 14 km within the city limits.

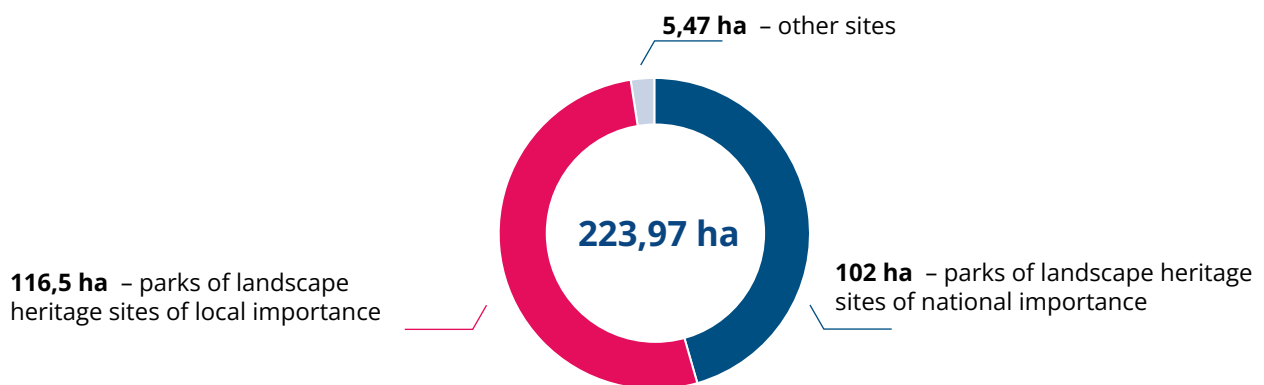
Vinnytsia hydrological network



- 1** - Pivdennyi Buh River
- 2** - Vyshnia
- 3** - Tyazhlyivka
- 4** - Vinnychka
- 5** - Piatnychanka
- 7** - Lisova
- 9** - Diohtianets
- 10** - Sheremetka
- 12** - Skakunka
- 15** - Kalicha
- 29** - Diohtianchyk
- 6, 8, 11, 13, 14, 16-28, 30-37 - unnamed

The nature reserve fund of Vinnytsia includes 13 sites of 4 different categories with an area of 223.97 hectares, which is 1.9% of its total area. The largest protected area in the territory of Vinnytsia is occupied by parks of landscape heritage sites of national importance (2 sites), which cover 102 hectares, and the sites of local importance (7 sites), which cover 116.5 hectares¹².

Vinnytsia nature reserve fund



The recreational area is represented by the quasi-natural landscapes that have been preserved within the city and its suburbs, as well as man-made green spaces (parks, community gardens, etc.), which have a positive impact on the environment and are an indicator of environmental well-being. The green zone of the city includes the Gorky Central

Park of Culture and Recreation, Yushchenko Park, Pyatnychansky Park, museum estates of Pirogov and Kotsiubynsky, and the Podillia Botanical Garden, which plantations are highly decorative and have a rich dendrological composition that includes several 300-year-old oaks (red and chestnut), Amur velvet, Weymouth pine, birch, and calla lily.

¹² <http://socrates.vsau.org/b04213/html/cards/getfile.php/22589.pdf>

Development plans for Vinnytsia CTC

In January 2022, the Declaration on Vinnytsia's Green Deal was announced.¹³ It defines the strategic course of the community's development, the basis for the development and implementation of all policies, infrastructure development, and investment attraction. The community has ambitious plans for the city's climate neutrality, decarbonization of the economy, agriculture, transport, energy system, transition to renewable energy sources, biodiversity conservation, and ensuring proper environmental quality of life for residents, etc. A Roadmap of Measures has been adopted for its implementation, and it is regularly updated.¹⁴

The vision for the development of Vinnytsia CTC before 2030 is outlined in the Vinnytsia City Territorial Community Development Strategy 2030 - Strategy 3.0 (hereinafter referred to as Strategy 3.0)¹⁵ and Vinnytsia CTC Integrated Development Concept 2030 (hereinafter referred to as IDC)¹⁶. Even though both were adopted before the war unleashed by Russia, they continue to be key documents that define the medium-term vectors of community development, which are updated by industry and sectoral planning documents. Strategy 3.0 has set six strategic priorities that define the sectors of the economy that will be developed or the areas of operations that will ultimately influence the development of a particular sector of the economy. Namely, the strategic priorities include:

1. *Digitalization of the municipal space*, which involves the digital transformation of municipal governance, development of digital services and services to citizens, digital participation and awareness.
2. *Integrated community: quality and accessible municipal services for all*, which includes the development of quality and inclusive education, strengthening the link between the education system and business needs. In fact, this goal is cross-cutting, as Strategy 3.0 inextricably links the development of any sector of the economy
3. *Municipal investment*, which includes investment in municipal infrastructure, development of business and tourism support infrastructure, access to quality drinking water, centralized wastewater collection and treatment, improvement of the system of household and industrial waste management, including hazardous waste, energy saving and renewable energy, sustainable urban mobility and affordable transportation services.
4. *Green economy and smart specialization*, which involves the development of sustainable and socially responsible business, economic growth through innovation (including the formation of a smart specialization of the agri-tech business) and transition to a green economy.
5. *Accessible, safe and environmentally friendly environment*, which aims to develop a green city (including expanding the existing network of nature reserves, protecting them and using them for tourism and recreational purposes), improving the ecological state of the Southern

In January 2022, the Declaration on Vinnytsia's Green Deal was announced

Photo: Vinnytsia City Council



¹³ Decision of Vinnytsia City Council No. 858 of 28.01.2022.

¹⁴ Roadmap of Vinnytsia City Territorial Community to implement the Vinnytsia Green Deal 2030. Decision of Vinnytsia City Council No. 2214 of 29.03.2024.

¹⁵ Decision of Vinnytsia City Council No. 194 of 26.02.2021.

¹⁶ IDC 2023.

Bug River, small rivers and other water bodies, rational use of land resources, etc.

6. *A vibrant city that* also aims to develop sustainable tourism.

The IDC offers a comprehensive approach to the development of Vinnytsia and its economic potential. For example, given the potential of industrial parks, trends in the structure of the city's industrial sector, the following industries have prospects for further development: machine building, food, woodworking and textile industries.

The development of technical infrastructure and energy efficiency envisages modernization of the city's heat supply system (reconstruction of heating networks, reconstruction and construction of boiler houses, CHP plants, installation of heat pumps, introduction of an automated system for monitoring the city's energy consumption), electricity supply (development of a specialized utility company for electricity supply, modernization and replacement of worn-out and obsolete equipment), implementation of energy efficiency and energy saving measures, which envisage implementation of energy efficiency and energy saving measures, which involves reducing energy consumption (in particular, thermal modernization of social institutions, construction of buildings with zero energy consumption), use of alternative energy sources (in particular construction of solar and wind power plants, installation of solar panels on the roofs of public sector institutions).

Vinnytsia CTC has updated several special planning documents to take into account the challenges of war. The Vinnytsia City Council adopted decision No. 2244 of 26.04.2024 «On Approval of the Program for the Development of Small and Medium-Sized Enterprises of Vinnytsia City Territorial Community 2024-2026» to implement measures aimed at creating favorable conditions for doing business, increasing the role and contribution of small and medium-sized enterprises to the economic and social development of Vinnytsia City Territorial Community, taking into account the principles and approaches of European experience in the formation and implementation of programs to support small and medium-sized enterprises.¹⁷ The document, inter alia, identifies areas for reforming and developing the economy, regardless of the organizational and legal form and ownership of business entities, based on the objectives tree,

priorities and tasks for economic development of Vinnytsia City Territorial Community. The basic priorities are as follows:

- modernization and development of the economy (food, woodworking, textile, and machine-building industries),
- development of new industries (IT sector, creative economy, green energy),
- SME development (the Roadmap for the Implementation of Vinnytsia's Green Deal emphasizes promoting the reorientation of SMEs to the production of environmental goods and services, as well as the transition to sustainable business practices as one of the measures).

Priority development areas:

- competitive tourism product and tourism infrastructure,
- agriculture and deep processing of agricultural products, organic production, agricultural market infrastructure, investments and new jobs, and organizational support for business entities in the agricultural sector,
- improving water resources, improving the waste management system, protection and efficient use of green spaces, preserving the nature reserve fund, and improving air quality.

The development of the economy of Vinnytsia CTC is based on the principle that is embedded in all strategic planning documents and has a cross-cutting nature. It's the formation of industry clusters. As stated in the documents, the clustering of the local economy will allow the community to concentrate its resources on promising areas with the best potential for growth. For example:

- agriculture contributes to the development of the food industry;
- woodworking contributes to the expansion of furniture production;
- production of building materials is the raw material base for construction;
- IT sector can help with the automation and digitalization of all industries and sectors;
- hospitality sector creates conditions for attracting business and personnel, developing the tourism business, while it is also growing as domestic demand for hospitality services intensifies.

¹⁷ <https://www.vmr.gov.ua/pidtrymka-biznesu>.

The plans for 2024-2026 include the creation of a cluster of light industry, tourism and hospitality, and an IT cluster.

Plan for creating clusters in Vinnytsia for 2024-2026



Light industry



Tourism and hospitality



IT

During 2022-2024 (in the time of war), the development areas of Vinnytsia CTC were updated in several sectoral planning documents, including those adopted for the purpose of development of the following sectors:

- agricultural sector.¹⁸ The innovative potential of the Vinnytsia CTC is expected to be formed as a smart specialization primarily in the agri-tech business. Priority tasks include the development of agriculture and deep processing of agricultural products (including the development of vegetable and potato growing, infrastructure for harvesting, storage and sale of vegetable and potato products), livestock (including providing the population with high-quality environmentally friendly livestock products, development of pig, sheep and poultry industries), pond fish farming, organic production and beekeeping. This will be facilitated by the development of private farms, improvement of the community's agricultural market infrastructure, investment support for the development of the community's agricultural sector, organizational support for agricultural business entities, and creation of new jobs. The growth in the number of people employed in the agricultural sector of Vinnytsia CTC serves as an indicator of how effectively the objectives are achieved, which is expected to reach 244 people in 2025.
- tourism industry.¹⁹ In the tourism sector, Vinnytsia City Council has identified sustainable tourism and investment in the development of business and tourism support infrastructure as its development goals. The goals will be realized in three strategic areas of development:

creation and promotion of tourism products, development of tourism infrastructure, and improvement of the quality of services, staffing, and communications in tourism. The community will promote the development of the main types of tourism (in particular, cultural and awareness, gastronomic, business and educational, active and ecological tourism) and niche tourism products (development of medical and health tourism, military and historical tourism products, memory walkways, and creative tourism products). The promotion of tourism products is also inextricably linked to the development of mobility infrastructure (creation of a network of electric vehicle charging stations, improvement of pedestrian, water and bicycle infrastructure, etc.), municipal infrastructure and landscaping, tourism infrastructure, and stimulation of SME development and investment. It is projected that the amount of tax revenues and fees from the tourism and hospitality sector to the budget of Vinnytsia in 2025 will amount to UAH 85 million, the number of visitors to tourist-oriented museums will be 240 000 people, and the number of registered tourism businesses will be 180.

- energy and energy efficiency.²⁰ One of the areas of development is the reduction of energy consumption from traditional energy sources using solar energy, as well as the reduction of CO₂ emissions by municipal buildings of Vinnytsia CTC. The priorities in this area include installation of solar panels at public sector sites and municipal property, as well as use of alternative energy sources to autonomize energy supply. The planned indicator titled «the share of

¹⁸ Agricultural Sector and Food Security Development Program 2023-2025 of Vinnytsia CTC. Decision of Vinnytsia City Council No. 1342 of 23.12.2022.

¹⁹ Vinnytsia Tourism Development Strategy 2030. Decision of Vinnytsia City Council No. 1666 of 26.05.2023; Tourism Development and Promotion Program 2024-2026 of Vinnytsia CTC. Decision of Vinnytsia City Council No. 1978 of 24.11.2023.

²⁰ Program for the construction of solar power plants to support electricity consumption by municipal buildings of Vinnytsia CTC 2023-2027. Decision of Vinnytsia City Council No. 1689 of 07.07.2023; Prospective Action Plan 2023-2026 under the European Energy Label. Decision of Vinnytsia City Council No. 1347 of 23.12.2022.

electricity generated by solar power plants in the total volume consumed by municipal property» should amount to 25% annually during 2024-2027. Since 2023, the city has been using a procedure for partial compensation of costs for equipment purchased to produce electricity from renewable energy sources.²¹

Expected results of the development of the Vinnytsia CTC in 2025



Agricultural sector

+ 244 people



Tourism industry

UAH 85 million- amount of tax revenues and fees
240 000 people - the number of visitors to museums
180 the number of registered tourism businesses



Energy

25% the share of electricity generated by solar power plants in the total volume consumed by municipal property

A set of measures that ensure the development of environmental services/goods is defined in the community's environmental program, which has been extended until 2025.²² The measures include activities to raise environmental awareness of the population, environmental education; improvement of water resources (the Pivdennyi Buh River cleanup within Vinnytsia city limits, restoration and maintenance of a favorable hydrological regime and sanitary condition of water bodies on the territory of Vinnytsia CTC; construction, reconstruction and overhaul of sewerage networks, stormwater drainage networks, etc. In 2023, some conceptual approaches²³ towards care, transformation, restoration and arrangement of the urban network of small rivers were identified.

In June 2024, the Program for the Comprehensive Revovey of the Vinnytsia City Territorial Community for 2024-2027 was adopted (Decision of the Executive Committee of 13.06.2024 No. 1399). The program is designed to address the challenges facing the community caused by a full-scale Russian invasion. The program sets three strategic goals: a safe environment (defense capability, safe living conditions, infrastructure restoration and modernization), a sustainable community (human capital, use of the territory's potential, environmental balance, green economy), caring governance (international standards and best practices, effective public administration, availability of municipal space).

²¹ <https://www.vmr.gov.ua/pidtrymka-biznesu#5>

²² Environmental Protection Program 2021-2025 of Vinnytsia CTC. Decision of Vinnytsia City Council No. 54 of 24.12.2020; Decision of Vinnytsia City Council No. 1920 of 27.10.2023 on the extension of the program and approval of a new version of implementation measures.

²³ On the draft decision of the City Council «On Approval of the Concept for the Development of Small Rivers of Vinnytsia - 2035». Decision of the Executive Committee of Vinnytsia City Council No. 1494 of 22.06.2023.



2

Section II.
**Green jobs in
Vinnytsia CTC**

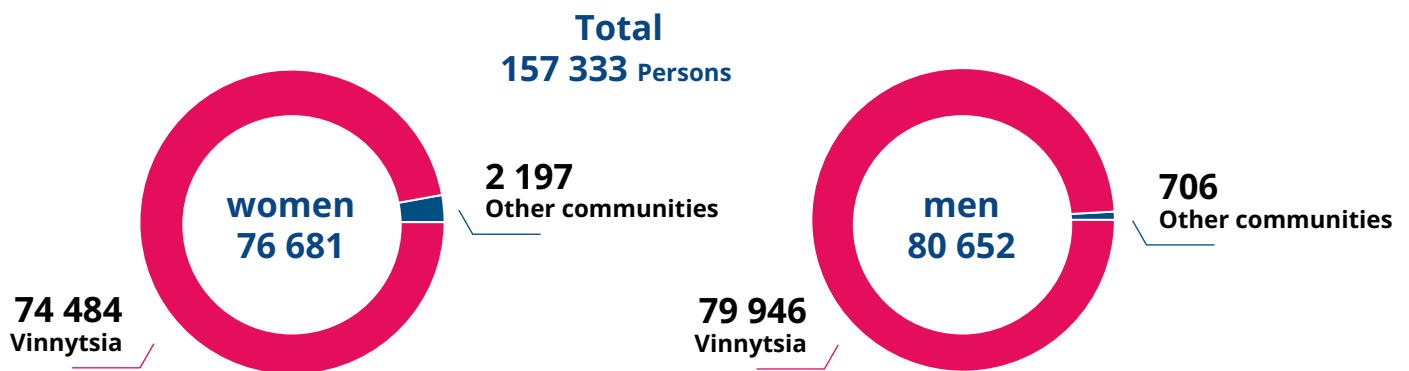


Vinnytsia City Territorial Community has already created 24,000 green jobs. The implementation of Vinnytsia’s Green Deal and community development plans will be accompanied by the creation of new green jobs. There are significant gender inequalities in green employment. Despite the fact that the community currently has a positive job seeker to vacancies ratio, businesses are already experiencing a shortage of workers in the production of green goods and services.

Vinnytsia City Territorial Community has a significant number of educational institutions of all levels. At the same time, local educational institutions, especially vocational ones, are currently unable to provide training sufficient in number and qualifications to fill green jobs.

As of January 1, 2024, the total number of employed population in Vinnytsia CTC was 157,333, where 76,681 were women (49%) and 80,652 were men (51%). 98% of all employees were employed in the city of Vinnytsia (154,430 people).

The number of employed population in Vinnytsia CTC (as of 01.01.2024).



Assessment of the current situation (by type of economic activity)

According to our estimates, 24 000 green jobs were created in Vinnytsia CTC (Table 1), which is 15.4% of all jobs. This share is quite high compared to, for example, some regions of Poland, where the same share ranges from 13.1% (Lubelskie Voivodeship) to 23.3% (Warsaw).²⁴ The average greenness of²⁵ green jobs is 7% (by definition, this figure is lower than the share of Gjs).

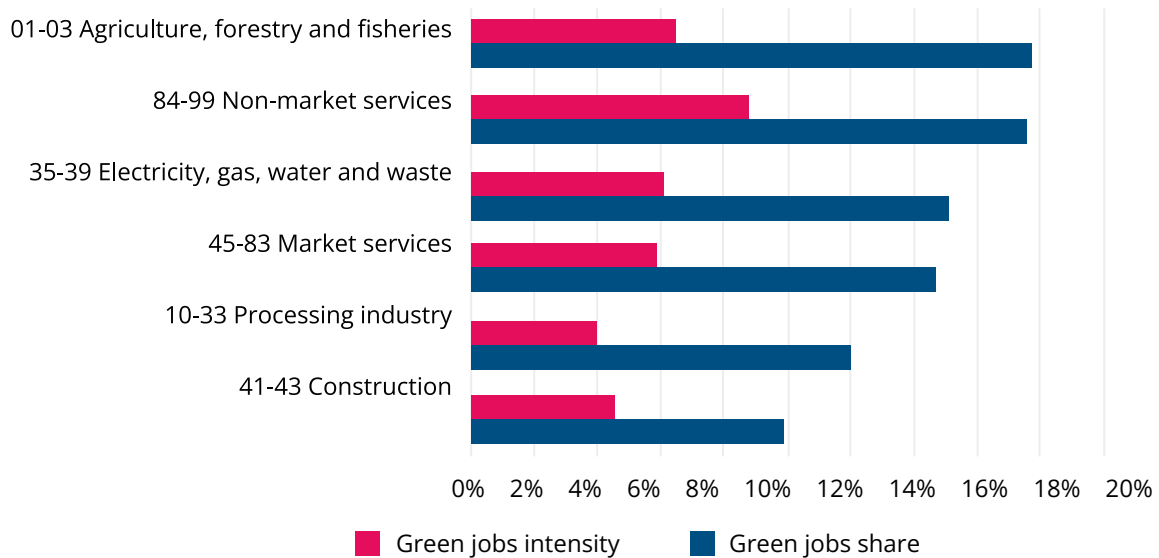
²⁴ OECD (2023), Job Creation and Local Economic Development 2023: Bridging the Great Green Divide, OECD Publishing, Paris, <https://doi.org/10.1787/21db61c1-en>.

²⁵ This indicator demonstrates the «greenness» of such jobs, i.e. the average share of green labor functions and actions (tasks and responsibilities) within this occupation. Such functions and actions are specified in the professional standard for the respective occupation included in the CO.

Table 1. Green jobs in Vinnytsia CTC, by type of economic activity.

TEA groups	Total Gjs	Number of women	Share of Gjs	Greenness of Gjs
01-03 Agriculture, forestry and fisheries	256	21%	18%	6%
05-09 Extractive industry	10	26%	²⁶	-
10-33 Processing industry	2 462	43%	12%	4%
35-39 Electricity, gas, water and waste	1 703	40%	15%	6%
41-43 Construction	889	14%	10%	5%
45-83 Market services	889	43%	15%	6%
84-99 Non-market services	12 331	38%	18%	9%
Total	24 159	39%	15%	7%

Figure 1. The share and greenness of green jobs by TEA groups.



Women hold only 39% of these positions, and they are mostly in the public sector. Among the industries with more than 500 Gjs, women outnumber men only in education, healthcare, retail, food production, and property maintenance. This situation clearly indicates significant gender inequalities in green employment in the community. If the current structure of employment by type of economic activity and occupation is maintained, this inequality will increase.

The public sector (non-market services) offers the largest number of green jobs (12 000), which can

generally be attributed to the high level of official employment in the sector. According to our data, a similar situation is also observed in other regions of Ukraine. In this group, the largest number of green jobs was created under three types of economic activity: «84 Public administration and defense; compulsory social insurance» (9 994), «85 Education» (1 193), and «86 Health care» (648).

In the market services group, most green jobs were created in the areas of wholesale and market trade, as well as building maintenance (Table 2).

²⁶ With the exception of the mining industry, as the total number of jobs in this sector (32) is too small.

Table 2. Main TEA in the market services group by the number of green jobs.

Type of economic activity	Number of GJs
46 Wholesale trade, except for motor vehicles and motorcycles	1 633
81 Maintenance of buildings and grounds	777
47 Retail trade, except for motor vehicles and motorcycles	731
68 Real estate transactions	589
71 Architecture and engineering; technical testing and research	446
45 Wholesale and retail trade in motor vehicles and motorcycles, repair of motor vehicles and motorcycles	317
69 Activities in the field of law and accounting	301
49 Land and pipeline transportation	273
52 Warehousing and transportation support activities	203
61 Telecommunications (electrocommunication)	186
62 Computer programming, consulting and similar activities	173
70 Activities of head offices; management consulting	122

In the processing industry (ranking third in terms of green jobs), there are several economic activities that offer a significant (over 100) number of green jobs. The undisputed leader here is food production (627 GJs).

Table 3. Green jobs in certain types of activities in the processing industry.

Types of economic activity	Number of GJs
10 Food production	627
25 Manufacture of fabricated metal products, except machinery and equipment	424
28 Manufacture of machinery and equipment	282
11 Beverage production	198
21 Manufacture of basic pharmaceutical products and pharmaceuticals	122
30 Manufacture of vehicles not elsewhere classified	104

The «Electricity, gas, water and waste» group is clearly dominated by TEA «35 Supply of electricity, gas, steam and air conditioning», where we estimate that 1 500 green jobs were created (out of 1 703 in the entire group). Water collection, supply, and sewerage create only 139 green jobs.

Type of economic activity	Number of GJs
35 Supply of electricity, gas, steam and air conditioning	1 476
36 Water collection, treatment and supply	137
38 Collection, treatment and disposal of waste; recovery of materials	86
39 Other waste management activities	2
37 Sewerage, wastewater disposal and treatment	2

The construction group demonstrates a fairly even distribution of green jobs: «42 Construction of structures» - 336, «41 Construction of buildings» - 333, «43 Specialized construction works» - 220, and a fairly high greenness of such green jobs.

Agriculture and forestry do not offer a significant number of green jobs (176 and 80 respectively).

Assessment of the current situation (by professional composition)

The analysis of green jobs in the community cannot be based solely on the type of economic activity of the employer. It is important to understand the professional composition of such green jobs, because they may be a problem for the community without a skilled workforce.

In terms of professional composition, most green jobs are related to managerial professions. This is due to the specifics of the chosen methodology and the structure of employment in the community.

A significant number of green jobs require professionals, specialists, and skilled workers with tools. Professions in all these groups require a certain level of education.

From a gender perspective, women prevail only in such groups as «unskilled occupations» and «technical employees» and are fairly evenly represented in the «professionals» group. A significant predominance of men is observed in such groups as managers and specialists.

Group of professions (positions)	women	men	GJs (total)
1. Legislators, senior civil servants, executives, managers (administrators)	4 442	7 404	11 846
2. Professionals. Codes 2111.1-2490	2 034	2 130	4 164
3. Specialists. Codes 3111-3590	1 605	2 768	4 373
4. Technical employees. Codes 4111-4229	85	61	146
7. Skilled workers with tools. Codes 7111-7990	809	2 051	2 860
8. Workers in maintenance, operation and control of technological equipment, assembly of equipment and machinery. Codes 8111-8990	8	19	27
9. Unskilled professions. Codes 9120-9411	418	326	744
Total	9 400	14 759	24 159

In the first group, only three professions account for 87% of green jobs («1229.1 Policy and planning managers (central government)» (4,834), «1210.1 Managing directors and chief executives» (4,553), and «1229.3 Policy and planning managers (local government)» (903). In this group, women occupy 37% of green jobs (mainly «heads of enterprises, institutions and organizations» and «senior officials of central government bodies»).

The group of professionals²⁷ mainly includes professionals in the civil service²⁸. In addition to these professionals, it is worth noting the role of lawyers, IT specialists, specialists in geosystems environmental monitoring, metrology and landscape design.

²⁷This section includes professions that require an employee (taking into account the range and complexity of certain professional tasks and responsibilities) to have an educational qualification at the first (bachelor's), second (master's), third (educational-scientific/educational-creative) level of higher education.

Table 4. Green jobs in the «Professionals» group.

Profession	Number of Gjs
2419.3 Civil service and local government professionals	2 304
2429 Legal professionals not elsewhere classified	700
2359.2 Information technology trainers	175
2148.2 Geosystems environmental monitoring specialists	173
2149.2 Metrology engineer	166
2144.2 Electronics engineers	120
2213.2 Landscape architects	101
...	

The profession²⁹ «3439 State Inspector for Technological and Environmental Supervision» dominates the group of specialists. This profession employs twice as many men as women. Other professions include technical specialists (mechanics, electricians, etc.) and energy conservation specialists. There are practically no women among mechanics and electricians (19 people in total).

Table 5. Green jobs in the «Specialists» group.

Profession	Number of Gjs
3439 State inspector for technological and environmental supervision	2 242
3119 Physics and engineering science technicians not elsewhere classified	550
3415 Commercial sales representatives	441
3115 Mechanical engineering technicians	298
3113 Electrical engineering technicians	287
3111 Building energy management specialist	174
3422 Clearing and forwarding agents	157
...	

In the group of skilled workers with tools, the largest number of green jobs is observed for such professions as «7233 Air conditioning and refrigeration mechanics», «7136 Plumbers and pipefitters» and «7129 Building frame and related trades workers», «7432 Quality controllers». A quarter of all women in this group (262) are employed under code 7432. Women also hold a significant number of positions as plumbers and ventilation system installers: 195 and 117 respectively.

Table 6. Green jobs in the «Skilled workers with tools» group.

Profession	Number of Gjs
7233 Air conditioning and refrigeration mechanics	920
7136 Plumbers and pipefitters	770
7129 Building frame and related trades workers	361
7432 Quality controller	262
7120 House builders	136
...	

²⁹This section includes professions that require educational qualifications at the level of professional pre-higher education, the initial level (short cycle) of higher education and, in some cases, the first (bachelor's) level of higher education.

In the group of the most unskilled occupations (janitors and garbage collectors), the most disturbing thing is that this is practically the only group where women significantly predominate (except for the small group of technical workers).

Finally, after removing non-market services (TEA 84-99), we see all the professions with more than 50 green jobs - only 3,520 such jobs and 15 professions were found (Table 7).

In this context, only four types of economic activity account for half of all jobs («35 Supply of electricity, gas, steam and air conditioning», «46 Wholesale

trade, except for motor vehicles and motorcycles», «10 Food production», «47 Retail trade, except for motor vehicles and motorcycles»). This suggests that outside the public sector, green jobs are created in a sporadic manner and are scattered across different professions and types of economic activity. Accordingly, their analysis and subsequent planning of actions to support their creation (or provide them with labor) should take into account the wide range of professions and economic activities where such jobs are or can be created.

Table 7. The most popular professions for green jobs.

Profession	GJs
3439 State inspector for technogenic and environmental supervision	500
7136 Plumbers and pipefitters	475
7233 Air conditioning and refrigeration mechanics	472
1314 Shopkeepers	364
3415 Technical and medical sales professionals (excluding ICT)	336
9162 Odd job persons	322
3119 Other technical specialists in physical sciences and engineering	231
2429 Other professionals in the field of law	192
7432 Quality controller	188
2148.2 Specialist in geosystems environmental monitoring	129
1229.7 Business services and administration managers not elsewhere classified	94
2141.2 Architects and urban planners	62
3111 Specialist in energy saving management in buildings	55
1233 Sales and marketing managers	51
3422 Clearing and forwarding agents	51
Total	3 520

Education for green jobs

There are 22 higher education institutions, 13 vocational pre-higher education institutions (including 10 in the city of Vinnytsia) and 19 professional (professional-vocational) education institutions (including 17 in Vinnytsia) in Vinnytsia CTC. Some of the schools have been relocated from the occupied territories.

As of April 1, 2024, the total number of students of vocational pre-higher education was about 13 000, higher education - 32 000 (6 000 of them were

extramural students), and vocational education - only 4 700.

In 2023, the total number of university graduates amounted to more than 8 000 people (2 000 of them were extramural students), and 2 808 graduates received specialized pre-higher education. In the field of higher education, the largest number of graduates is observed in such specialties as management, health, education, law, accounting and taxation, finance and banking, public administration, computer science, and others.

Table 8. Number of graduates by field of study (2023).

Field of study	Full time, publicly funded	Full time, commercial	Extramural, publicly funded	Extramural, commercial	Total
07 Management and administration (taxes, finance, management, etc.)	185	705	22	873	1785
22 Healthcare	447	659	0	86	1192
01 Education	468	149	56	158	831
12 Information technologies	325	360	4	32	721
08 Law	62	262	3	115	442
05 Social and behavioral sciences	50	175	5	177	407
20 Agricultural sciences and food	177	84	32	100	393
14 Electrical engineering	141	103	12	81	337
28 Public management and administration	9	67	0	192	268
03 Humanities	116	110	0	3	229
18 Production and technology (food, environmental protection)	54	35	18	120	227
24 Service sector	23	139	0	59	221
19 Architecture and construction (civil and structural engineering)	66	39	2	60	167
27 Transportation	60	57	2	34	153
10 Natural sciences	47	74	3	16	140
29 International relations	22	95	0	21	138
15 Automation and instrumentation	106	27	1	3	137
13 Mechanical engineering	55	43	8	16	122
17 Electronics, automation and electronic communications	54	24	0	15	93
23 Social work	22	37	8	13	80
06 Journalism	8	20	0	22	50
02 Culture and art	22	26	0	0	48
09 Biology	17	7	0	13	37
16 Chemical engineering and bioengineering	4	24	1	3	32
11 Mathematics and statistics	17	6	0	0	23
21 Veterinary medicine	0	6	0	0	6
Total	2557	3333	177	2212	8279

Source: USEDB.

Unlike higher education institutions, local (regional) authorities have a direct influence on the volume of public procurement in the field of professional (professional and technical) education through regional public procurement orders. Analysis of the professional composition of students shows significant disparities between professions. 50% of all students of professional and technical education are trained in only 4 professions: cooks (20% of all students in this field), hairdressers (makeup artists), vehicle repairmen and computer operators.³⁰

Table 9. Recipients of vocational education by profession (2024).

Professions	Full-time (commercial)	Full-time (public funds)	Total
5122 Cooks	22	917	939
5141 Makeup artists, beauticians and similar	46	558	604
7231+7233 Motor vehicle mechanics and repairers	22	447	469
4113 Information and software operator	0	307	307
7433+7436 Tailors and seamstresses	0	213	213
7133 Drywaller	22	175	197
5161 Firefighters and rescuers	139	52	191
4112 Data entry operators	17	154	171
7141+7142 Painters and restorers	3	150	153
7241 Electrical mechanics and electricians	12	118	130
5169 Guard	125	0	125
5169 Security guard			
5162 Police officer (by specialization)	116	0	116
7242 Installers of information, communication and electronic equipment	1	104	105
7344 Photographers	0	90	90
7122 Bricklayers	2	83	85
4131 Stock clerks	5	75	80
7136 Plumbers and pipe fitters	0	75	75
5312 Performer of artistic and design works	0	74	74
7213 Auto body repair technician	24	49	73
7212 Electric and gas welder			
7331 Florist	0	71	71
5312 Decorator of display windows, rooms and buildings			
7243 Firefighters	34	23	57
4222 Administrators	1	50	51
7124 Construction site carpenter	0	50	50
4221 Tourism	9	40	49
7313 Jeweler-assembler	22	24	46
7313 Jeweler-fixer			
8211 Machine operators	0	42	42
4115 Secretaries	5	34	39
5133 Social worker	30	0	30
7212 Electric and gas welder	4	21	25
5123 Waiter / bartender	5	20	25
7244 Electrician of security and fire alarm system	21	0	21
7412 Bakers	0	19	19
Total	687	4035	4722

32 ³⁰ According to the USEEX <https://info.edbo.gov.ua/>.

Two educational institutions participate in the State Employment Service's pilot program for comprehensive short-term training programs offering partial qualifications, retraining and professional development in energy efficiency in technologically related professions in the construction industry - Kryzhopil Vocational Construction Lyceum (Window and door installer) and Higher Vocational School No. 7 in Vinnytsia (Advanced thermal modernization systems for buildings and structures).

Specifics of the utilities sector

Current state and prospects

22.5% of the surveyed utility enterprises indicated that they produce green goods (services). The following services have been mentioned:

- providing district heating and water supply services using wood chip boilers;
- transportation of passengers by electric vehicles;
- generation of solar electricity for own consumption;
- providing lending services to individuals for home insulation;
- design of projects in the field of sustainable urban mobility (development of the bicycle network, prioritization of public electric transport, improvement of conditions for pedestrians);
- educational activities on sustainable urban practices (greening of urban spaces, water management, etc.);
- production of eco-friendly souvenirs;
- maintenance, cleaning, and landscaping of parks, squares, and the city's waterfront;
- non-hazardous waste collection services.

Almost half of the surveyed enterprises stated that they do not produce environmental goods (services). At the same time, some of these enterprises should produce such goods, given the nature of their

business. For example, enterprises that provide services to nature reserves (e.g., nature reserves, parks, etc.), apartment building management services, urban planning and architecture services.

In addition, almost a third of enterprises did not answer the question whether they produce environmental goods (services) at all, despite the fact that they were offered an indicative list of such goods and services. The survey revealed that representatives of enterprises had difficulty understanding which goods and services are environmentally friendly and whether their company produces such goods (services). This can be explained by the lack of information campaigns or other activities explaining the concept of environmental goods and services in Ukraine in previous years.

The number of employees engaged in the production of green goods (services) varies and ranges from 5% (e.g., supply of steam, hot water, and air conditioning) to 80% (e.g., collection of non-hazardous waste). 44% of enterprises (who reported producing green goods (services)) indicated that half or more of their total employees are engaged in the production of such goods (services). 78% of such enterprises also believe that demand for their environmental goods (services) will grow in the next five years and they plan to increase production.

Staffing needs and prospects

42.5% of the surveyed enterprises indicated that they are experiencing a shortage of staff, both in terms of employees in general and some specialists. On the other hand, the majority of surveyed enterprises indicated that they do not experience a

general shortage of employees. Nevertheless, 62.5% of firms indicated that the shortage of workers will only increase in the next five years or that only the shortage of highly skilled workers will increase. And only a quarter of companies believe that the labor

market will stabilize and labor supply will return to pre-war levels.

88.9% of enterprises that indicated that they produce environmental goods (services) point to a shortage of specialists needed to produce such goods (services). Depending on the type of business, enterprises indicated a shortage of the following specialists:

- engineers and mechanics;
- general production workers (tractor drivers, machine operators, drivers of special equipment, road workers, cleaners, loaders);
- legal support staff;
- tram, trolleybus, and bus drivers;

Educational needs and prospects

37.5% of the surveyed enterprises believe that educational institutions in Ukraine train specialists for the production of green goods (services), while 32.5% say they do not.

Almost the same share of companies provided answers about their needs for specialists who are not currently trained by educational institutions in Ukraine, ability to train such specialists in-house, and further investments in training of the required specialists; two-thirds of the surveyed companies said they would not need such specialists, they did not train them in-house, and did not plan to invest time and money in training specialists in the future.

One-third of companies not only train their own employees, but also plan to invest in the education and training of personnel in the future. One-third of enterprises believe that in the future they will need specialists who are not currently trained by educational institutions. They noted that they will need educational services to train such specialists and professionals who are able to implement and apply nature-based solutions, specialists in the circular economy, the New European Bauhaus,

- electrical mechanics, electrical engineers, mechanics, and machine operators;
- skilled workers in parks and services;
- professionals who have an understanding and knowledge of modern urban landscaping practices, tree management, and the use of nature-based solutions.

77.8% of companies that produce environmental products attribute the lack of specialists to the military mobilization of employees; one-third of surveyed companies attribute it to migration of employees abroad, and another third to the fact that educational institutions do not train relevant specialists.

urban sustainability, arborists, specialists in sustainable urban mobility, urbanism, etc.

Businesses expressed their views on the measures that should be taken to address the shortage of required specialists. Their recommendations included:

- ending the war in Ukraine, retaining personnel during the war, and creating conditions for the return of personnel after the war;
- ensuring proper working conditions and raising wages;
- reforming education, introducing new educational programs, and developing self-education;
- promoting and strengthening cooperation and partnership between employers and educational institutions in training the necessary personnel;
- government support and implementation of mechanisms to support and encourage the training of the required personnel.



3

Section III.
**European
experience**



Cities in the European Union are a source of rich practice in implementing measures for the green transformation of communities. Their experience, of course, includes local employment and labor market issues and offers interesting successful practices for creating new jobs, career development and education for the green transition.

Successful practices of the European cities

European cities have been gaining experience in green transition and sustainable community development for several decades. The time of «pioneers» is long over, and in the last 10-15 years, a significant number of EU cities have gained considerable experience in implementing green development strategies. In this process, these cities have, of course, also addressed issues related to the creation of new green jobs and phasing out of old (unclean) ones. Each city is a separate socio-economic system, and each city is looking for its own way of development. Below are some interesting successful practices implemented by cities of different sizes.

Anavra (Greece)



A remote mountainous village of Anavra in southeastern Greece has been very successful in harnessing the potential of a green transition. Between 2000 and 2010, the unemployment rate in the municipality dropped to zero, the population almost doubled from 300 to 550, and the quality of life improved. Anavra's green transition even attracted worldwide attention, turning a previously poor, isolated village into a model of sustainable local development.

Anavra has managed to build a wind farm of 20 turbines with a total capacity of up to 17.5 megawatts, which can provide electricity to 12 500-13 000 homes. Two more wind farms are currently under construction, consisting of 23 turbines with a total capacity of 20 megawatts.

These projects have created 20 permanent and 100 temporary jobs. The surplus electricity is sold on the market, and the first wind farm alone brings the village an additional income of about 60 000 euros per year.

Bremerhaven (Germany)

The coastal city of 120,000 located in the state of Bremen has taken advantage of the greening trend to restructure its economy, which was traditionally centered on shipbuilding. Many steps have been taken by the local authorities, including investments in infrastructure, research in the wind energy sector, and increased provision of relevant vocational training. In 2002, the Wind Energy Agency (WAB) was established, a network of 300 companies and institutes working in the wind energy sector

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(manufacturing, installation and research) to serve as a national center for the offshore wind industry.

In May 2019, the Senate of Bremen made a decision that the creation of a new green hydrogen chain could provide an important structural stimulus that could lead to more jobs. In 2023, the Bremerhaven Hydrogen Laboratory became actively operational, with the aim of providing scientific results and thus helping to support companies and the industry on the path to a sustainable hydrogen economy.

Wallonia (Belgium)



Since 2009, the Green Party ministers in two of Belgium's three regions - Brussels and Wallonia - have been pushing hard for the creation of so-called «Employment-Environment» alliances in an effort to create green jobs. In Wallonia, these alliances have received a total budget of €879 000 000 under the «Marshall Plan 2.Green», a framework program adopted by the Walloon government to integrate sustainable development into all its policies and revitalize the Walloon economy.

The idea behind the Alliance is that policies that support the green transition of economic sectors can create new jobs and support the long-term viability of these sectors. Particular attention is paid to energy efficiency in buildings. Almost 50% of the buildings in Wallonia were built before 1945, have very poor thermal insulation and cause very high energy consumption. Any jobs created as a result of these measures will necessarily be local and therefore cannot be lost to «delocalization».

Burgenland (Austria)

In 1997, the federal state of Burgenland set a goal to become energy independent by 2050 by generating electricity from local renewable sources.

This was intended to increase local employment and stimulate economic development, while reducing dependence on fossil fuels and cutting energy costs in the region.

In 2013, Burgenland became the first region in Europe to meet its electricity needs from local renewable energy sources, including wind, solar and biomass. This strategy has created 5 560 new jobs in a state with a population of 284 000 and increased GDP per capita from 71% (1995) to 81% (2008) of the EU average.



Among the 250 renewable energy projects initiated in Burgenland, the city of Güssing has focused on biomass production, using local resources from forestry and agriculture and building a number of heat and power plants as well as a biomass power plant.

The implementation of these projects attracted the attention of biomass experts to Burgenland, leading to the creation of the European Renewable Energy Center and a specialized bioenergy research

center called the Technikum. This research pool has allowed Güssing to develop all existing technologies capable of converting biomass into energy. As a result, more than 1 000 new jobs have been created in Güssing, with a population of 26 507, and more than 50 new businesses have opened or relocated to the city in the last 20 years. This has made Güssing a model for other regions that intend to take active measures to protect the climate.

Czech Republic



In 2009, the national program «Green Savings» (2009-2012) was launched, which promoted energy savings in private homes by providing participating households with direct subsidies of 30-75% of the costs incurred. The program supported the improvement of thermal insulation (e.g., by replacing old doors and windows), replacement of environmentally unfriendly boilers, purchase and installation of solar energy systems, and construction of new energy-efficient houses.

Between 2009 and 2012, more than 250,000 households across the Czech Republic benefited from the program with a total value of €967 million. The estimated reduction in CO₂ emissions due to

the program at the end of 2012 was 864 000 tons per year, equivalent to the total emissions of a Czech city with a population of 69 000 inhabitants.

About 16 000 jobs were created or saved, mostly in small and medium-sized enterprises operating in the construction sector.

In total, the government subsidies provided under the program will allow households to save up to EUR 1.5 billion a year on heating alone.

Such a program can also be implemented at the city or community level.

Growth of careers in sustainable development











London ranks first as the best city to have a career in sustainable development, with over 10 400 jobs available. In addition, there are just under 3 000 vacancies that require green skills, where employers are looking for workers with green economy skills such as recycling, sustainability, and energy conservation.

Paris, the French capital, ranks second with more than 12 000 green economy jobs - the highest number of any city. Lyon, another French city

located in the Auvergne-Rhône-Alpes region, ranks third with 10 554 sustainability jobs.

Zurich and Munich round out the top five with 809 and 3 459 jobs, respectively. Although the number of jobs in Zurich is lower than in the other top five cities, the Swiss city has the highest average monthly salary (6 410 euros).

Table 10. Green jobs in some European cities.










No.	City	Jobs in the field of sustainable development	Jobs requiring green skills and knowledge	Average salary, month, EUR
1	 London	10 417	2 784	3 461
2	 Paris	12 015	677	2 673
3	 Lyon	10 554	856	2 577
4	 Zurich	809	200	6 410
5	 Munich	3 459	1 011	3 364
6	 Manchester	3 654	1 246	2 595
7	 Berlin	3 155	1 053	3 001
8	 Hamburg	2 334	844	3 194
9	 Bruges	8 055	30	2 000
10	 Toulouse	4 600	343	2 838

Green skills


Today, most jobs - whether they are classified as «new green jobs» or as existing occupations requiring environmental skills or as those requiring «re-skilling» - already have a base of highly relevant skills and simply need to be «upskilled». This would be characterized by additional training to familiarize

workers with new concepts and practices that will enable them to work in low-carbon industries. There are many examples of relevant retraining or upskilling programs (Table 11).

Table 11. Examples of professional development programs in new professions.

Country	Employment sector	Key training	Professional development	A new area of employment
 Denmark	Industrial electrician/energy technologist	Vocational qualifications / higher engineering education	Knowledge of energy sources, ability to integrate energy systems, project management	Manager in the field of renewable energy
 Denmark	Industrial operator / industrial electrician	Vocational qualifications / complete secondary education	Assembling, installing parts, using tools	Operator of wind power plants
 Estonia	Builder	No professional standard	Knowledge of energy systems, data analysis, project management	Energy auditor
 France	Worker in the waste management sector	General certificate of professional qualification	Sorting and receiving techniques, knowledge of air conditioning and storage	Waste processing operator
 France	Product and service design	22 basic vocational training courses with different specializations	Integration of environmental criteria into the design process, integrated assessment and life cycle analysis	Ecodesigner
 Germany	Electronic/mechatronic technician	Basic professional training	Electronics and hydraulic systems, safety, operation and maintenance	Service technician for wind energy
 Germany	Plumber / electrician and heating installer	Basic professional training	Technical training, knowledge of administrative procedures, entrepreneurial skills	Entrepreneur in the field of solar energy / plant designer
 United Kingdom	Engineer in the field of energy	Higher engineering education	Installation and maintenance of low-carbon technologies, customer service skills	Smart energy expert/smart energy manager
 United Kingdom	Commodity trader/broker	Higher qualification	Practical skills in the functioning of the carbon market, understanding of trading instruments	Carbon trader/broker

Source: CEDEFOP (2010).



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Section IV. **Conclusions and Recommendations**



Ambitious plans for sustainable development of Vinnytsia City Territorial Community will help create new green jobs

Vinnytsia's Green Deal identified the strategic path of the community's development. These are ambitious plans for climate neutrality of the city, decarbonization of the economy, agriculture, transport, energy system, transition to renewable energy sources, biodiversity conservation, and ensuring proper environmental quality of life for residents. Strategic documents lay the path for the modernization and development of such major economic sectors as food, woodworking, textiles, and machine building, as well as the development of new industries, such as IT and computer engineering, creative economy (including the development of creative hubs and spaces), and green energy (including the development of solar power).

Promoting the reorientation of SMEs to the production of environmental goods and services, as well as the transition to sustainable business practices, is considered one of the measures to implement the Vinnytsia Green Deal.

European experience shows that such strategic goals will lead to the creation of additional green jobs in many areas of the local economy.

Vinnytsia community already offers a large number of green jobs, the share of which is fully in line with the European indicators

According to our estimates, 24 000 green jobs were created in Vinnytsia CTC, which is 15.4% of all jobs in the community. The share of such jobs is quite high compared to the European regions. For example, in Poland, the number ranges from 13.1% (Lubelskie Voivodeship) to 23.3% (Warsaw).³¹ The average intensity («greenness») of such jobs is 7%, which is also quite positive.

There is a significant gender inequality in green jobs, which will grow in the future unless comprehensive measures are taken

Women hold only 39% of green jobs, mostly in the public sector. Among the industries with the largest number of green jobs, women outnumber men only in education, healthcare, retail, food production, and home maintenance. This indicates significant gender inequalities in green employment in the community.

Women predominate only in such groups as «unskilled occupations» and «technical workers» and are fairly evenly represented in the «professionals» group. A significant predominance of men is observed in such groups as managers and specialists. There are practically no women among mechanics and electricians.

This inequality will increase if the current structure of employment by type of economic activity and occupation is maintained. This situation is exacerbated by the fact that women make up a significant majority of all unemployed people in the community (there are four times more unemployed women than men).

Half of all green jobs are in the public sector

The non-market services group (public administration, health care, education, and others, CEA 84-99) currently contains the largest number of green jobs in the community, and their share is the highest. This is not a typical phenomenon in EU countries and can be explained by both the specifics of the methodology and the features of employment in the community, in particular the high level of official employment in this group of economic activities.

³¹ OECD (2023), Job Creation and Local Economic Development 2023: Bridging the Great Green Divide, OECD Publishing, Paris, <https://doi.org/10.1787/21db61c1-en>.

Employment in managerial and professional positions in central and local governments accounts for about a third of all green jobs.

Under any circumstances, the role of the public sector in ensuring a green transition is important. Given the high employment in this group in Vinnytsia CTC, the knowledge and skills of the persons holding the relevant positions will be crucial to the public sector's ability to stimulate green community development.

Outside of the public sector, green jobs are characterized by a significant dispersion by type of economic activity and occupation

Outside of the non-market services group, only 3 700 green jobs were created in clusters of more than 50 jobs, supported only by 16 professions. Half of these jobs are supported by only four types of economic activity (energy, wholesale trade, retail trade, and food processing).

The development of small and medium-sized enterprises, as one of the strategic goals of the community, will require special attention to small clusters of green jobs. Excessive attention to large-scale areas (where more than 50 green jobs are created) can lead to a loss of the green potential of SMEs.

The lowest share of green jobs is in the construction sector

The construction sector offers only about 900 green jobs, and their share is low - 10% (and greenness is 5%). Under such conditions, the introduction of modern practices (energy saving, energy efficiency, renewable energy sources, etc.) in this sector will be slow or require a non-local workforce (involving enterprises and specialists from other regions).

Wholesale and retail trade create more green jobs than the energy sector

The trade sector creates about 2 500 green jobs in the community. Its role in the green transition should not be underestimated. Mostly in the trade sector, we are talking about small business managers, technical and sales representatives.

The energy sector and the manufacturing industry are special magnets for green jobs

The energy sector creates about 1 500 green jobs, the food industry (including beverage production) - almost 800, and the metalworking industry - almost 500. Given that the community's priorities are to develop the food, machine-building, and green energy industries, the number of green jobs in these sectors will grow. This will require additional qualified personnel.

Community businesses do not understand the meaning of green goods and services

It turned out that representatives of enterprises (including utilities) had difficulty understanding what goods and services are green and whether their company produces such goods (services). Even enterprises that, by definition, produce such goods or provide services do not realize their role in the community's economy and the potential for a green transition.

Lack of knowledge about green goods and services, green jobs will make it difficult for such enterprises to attract investment, loans and international technical assistance aimed at climate or environmental goals.

Utilities are important in the production of environmental goods and services, and their role in creating green jobs will grow

At least a quarter of municipal enterprises produce green goods or provide environmental services. The vast majority of them believe that demand for their products will grow in the near future, so they plan to increase their production.

According to our estimates, a significant share of existing green jobs are created in utilities. This applies to such sectors as heat supply, water supply and sewerage, waste, as well as education, medicine, and building maintenance.

Given that municipal investment is one of the strategic development areas for Vinnytsia CTC, the role of municipal enterprises in ensuring green community development and, consequently, green jobs will grow.

In terms of occupation, the majority of green jobs are related to managerial professions

At the same time, a significant number of green jobs require professionals, specialists, and skilled workers with tools. Outside of the public sector and executive positions, the most common green jobs are those of lawyers, information and cybersecurity professionals, geosystems environmental monitoring specialists, metrology engineers, technical and sales representatives, technical specialists in science and technology, mechanics and electricians, plumbers, construction workers, material and quality controllers, ventilation (air conditioning) installers, small business managers, and janitors.

Currently, there is no labor shortage in the labor market, but there is a lack of specialists in the field of green goods and services

Most municipal enterprises do not currently experience a general shortage of staff but emphasize that the shortage of employees will increase in the coming years. At the same time, the vast majority of enterprises that reported producing environmental goods (services) report a shortage of specialists needed to produce such goods. The shortage of such specialists will increase in the future.

Ending the war, retaining and bringing personnel back during and after the war, decent work, education reform, strengthening cooperation between employers and educational institutions, government and financial support are key conditions that will help overcome the shortage of specialists.

The educational sector is currently unable to provide training in the areas and according to the levels of training required for green jobs

One-third of surveyed enterprises believe that educational institutions do not currently train the specialists needed to produce environmental goods (products). Almost a third of enterprises train the necessary specialists in-house and are ready to invest in training their own staff in the future.

In the higher education sector, the number of students/graduates is generally sufficient, but there is a lack of training in many areas necessary to prepare specialists for green jobs in natural sciences, mechanical engineering, electronics. Some elements (topics, disciplines) related to the green economy need to be included in the curriculum in many specialties (law, economics, etc.).

Vocational education in the community is not able to provide green jobs with skilled workers

50% of all vocational education students only master 4 professions: cooks (20% of all students in this field), hairdressers (makeup artists), vehicle repairmen, and computer operators. The total number of students in vocational education and training institutions is only 4 700.

Unlike higher education, local (regional) authorities have a direct influence on the volume of public procurement in the field of vocational education and training through regional public procurement orders.

The experience of the European countries shows the need to introduce additional educational programs, courses, etc. to provide students with the modern skills necessary to perform work in the field of green development and create new green jobs, such as: renewable energy manager, wind power plant operator, energy auditor, ecodesigner, etc.

Recommendations

Given the results and conclusions, we make the following recommendations to Vinnytsia City Territorial Community:

- Take into account that achieving the goals of the ambitious green deal of the community will be accompanied by the creation of new green jobs, which requires regular monitoring of this segment of the labor market and its impact on the community, businesses and people (in particular, by establishing algorithms for cooperation and data exchange with the State Statistics Service, the State Tax Service, the Pension Fund of Ukraine and the State Employment Service, regular observations of business entities' practices, special research, etc.).
- Consider the feasibility of developing a special program for the development of green jobs in the Vinnytsia City Amalgamated Territorial Community (according to the decision No. 2244 of 26.04.2024 «On Approval of the Program for the Development of Small and Medium-Sized Enterprises of the Vinnytsia City Territorial Community 2024-2026», where paragraph 2.1 provides for «Conducting a study of the situation and opportunities for green jobs in the VCTC economy 2024-2026»).
- Initiate a regular exchange of experience (forum) with other territorial communities of Ukraine on the role of green jobs in local development.
- Introduce cross-cutting professional development (upskilling) programs in the public administration, education and healthcare sectors to deepen the knowledge of all employees about current trends in the green transition.
- Create a network of green educational clusters (based on partnerships between utilities and community-based educational institutions) as centers of excellence for green qualifications for new jobs.
- Promote educational activities (programs) for persons holding managerial and financial positions in the public and private sectors, without whose participation it is impossible to implement green projects and initiatives.
- Develop a local strategy to ensure gender equality in the green jobs market, provide support for training and engagement of women in professions where there is a significant imbalance in employment between men and women.

- Conduct outreach to community businesses to raise their awareness of environmental goods and services and green jobs.
- Pay special attention to the small and medium-sized enterprise sector, whose support can be closely linked to the creation of green jobs in small numbers.
- Use the existing levers of community influence towards the design and major repairs of buildings to integrate environmental and climate requirements (including energy efficiency, circularity, greenhouse gas emissions, etc.), which will increase the number of green jobs in the sector.
- Cooperate with the regional executive authorities to form a regional order in the field of vocational education, opening new educational programs that would meet the current and future labor demand for green jobs.
- Encourage community enterprises to participate in dual education programs in all educational institutions of the community (including higher education institutions).

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European experience shows that such strategic goals will lead to the creation of additional green jobs in many areas of the local economy.»

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