Promoting the penetration of agrobiomass in European rural areas

Grant Agreement No 818369

D5.1: National and European framework conditions

Part 9: National framework conditions - Ukraine

Lead Beneficiary: UABIO
Main author: Tetiana Zheliezna, Semeon Drahniev (UABIO)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 818369.

Deliverable Factsheet	
Full title	National and European framework conditions. Part 9: National framework – Ukraine
Deliverable Number	D5.1
Work Package	WP5 Providing Europe with a strategy and regulations for agrobiomass heat
Task(s)	T5.1 Monitoring of current national and European framework conditions
Lead Beneficiary	UABIO
Main authors	Tetiana Zheliezna, Semeon Drahniev (UABIO)
Version	1.0
Date	29 January 2020

Dissemination Level	
X	PU - Public
	PP - Restricted to other programme participants (including the EC)
	RE - Restricted to a group specified by the consortium (including the EC)
	CO - Confidential, only for members of the consortium (including the EC)

Approvals	
Task Leader	B.E.
WP Leader	B.E.
Reviewer	Manolis Karampinis (CERTH), Alberto Rocamora (B.E.)

Document history

Version	Date	Main modification	Entity
1.0	29 January 2020	Final version, integrating review comments	UABIO

Disclaimer of warranties

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 818369.

This document has been prepared by AgroBioHeat project partners as an account of work carried out within the framework of the EC-GA contract no 818369.

Neither Project Coordinator, nor any signatory party of AgroBioHeat Project Consortium Agreement, nor any person acting on behalf of any of them:

a. makes any warranty or representation whatsoever, express or implied,
    i. with respect to the use of any information, apparatus, method, process, or similar item disclosed in this document, including merchantability and fitness for a particular purpose, or
    ii. that such use does not infringe on or interfere with privately owned rights, including any party's intellectual property, or
    iii. that this document is suitable to any particular user's circumstance; or
b. assumes responsibility for any damages or other liability whatsoever (including any consequential damages, even if Project Coordinator or any representative of a signatory party of the AgroBioHeat Project Consortium Agreement, has been advised of the possibility of such damages) resulting from your selection or use of this document or any information, apparatus, method, process, or similar item disclosed in this document.

Abbreviations

Abbreviation	Explanation
DH	District Heating
NAPCP	National Air Pollution Control Programme
NECP	National Energy and Climate Programme
RDSs	Rural Development Strategies
VAT	Value Added Tax

Project consortium

#	Full name	Acronym
1	Ethniko Kentro Erevnas kai Technologikis Anaptyxis	CERTH
2	Fundación Centro de Investigación de Recursos y Consumos Energéticos	CIRCE
3	Asociación Española de la Valorización Energética de la Biomasa	AVEBIOM
4	BIOS BIOENERGIESYSTEME GmbH	BIOS
5	Food & Bio Cluster Denmark	FBCD
6	Bioenergy Europe	B.E.
7	Zelena energetska zadruga za usluge	ZEZ
8	Asociatia Green Energy	GEA
9	Institouto Agrotikis kai Synetairistikis Oikonomias INASO-PASEGES	INASO-PASEGES
10	Bioenergy Association of Ukraine	UABIO
11	White Research Sprl	W.R.
12	Agronergy	AGRONERGY
13	Association d'Initiatives Locales pour l'Energie et l'Environnement	AILE

Contents

List of Tables

List of Figures

Country: Ukraine

- Ukraine is the second largest country in Europe with the area of 603,549 km^2 and population of over 42 million, the majority of which (69%) lives in urban areas[1].
- Agriculture is one of the key economic activities contributing about 10.2% to Ukrainian GDP. Agricultural lands make up 68.7% of the total area of Ukraine[1].
- Agricultural residues are abundant. Balers for cereal straw are available on Ukrainian market while balers for maize stalks practically are not available.
- Biomass for energy is consumed in Ukraine mainly in the form of firewood, wood chips, wood pellets and briquettes, sunflower husk (including pellets and briquettes).
- Main application of biomass for heat production is in industry and households.
- Historically, Ukraine has a well-developed district heating (DH) system, though the use of biomass in it is very low. Natural gas remains the main fuel in DH.

[1] Ukraine in figures 2018. Statistical book by the State Statistics Service of Ukraine http://www.ukrstat.gov.ua/

1. Agrobiomass availability

Agricultural residues	
Straw	**CEREAL CROP PRODUCTION:** Production of cereal crops has the central role in Ukraine's agriculture. In 2018 the sown area under cereals (excluding grain maize) was 9,694.3 Kha[2], which represented 35% of the total sown area in Ukraine (27,699.3 Kha in 2018[2]). **GEOGRAPHICAL DISTRIBUTION:** Cereals cultivation has more density in central, southern and eastern regions of Ukraine (Vinnytsia, Odesa, Kharkiv regions in particular) but it takes place in all the regions of Ukraine. **ESTIMATION OF BIOMASS PRODUCTION:** Potential of straw of cereals (excluding grain maize) is assessed as 3.4 Mtoe[3] (2018). **USES:** Straw has several different uses, including organic fertilizer, livestock bedding and fodder, building material and fuel. **PRICES:** Price of baled straw is about 30 €/t.
Maize crop residues (stalks, cobs)	**MAIZE CROP PRODUCTION:** Production of grain maize is an important part of Ukraine's agriculture. In 2018 the sown area under grain maize was 4,579.7 Kha[2], which represented 16.5% of the total sown area in Ukraine. **GEOGRAPHICAL DISTRIBUTION:** Maize cultivation has more density in central and northern regions of Ukraine (Vinnytsia, Poltava, Chernihiv regions in particular) but it takes place in all the regions of Ukraine. **ESTIMATION OF BIOMASS PRODUCTION:** Potential of residues of grain maize production is assessed as 3.6 Mtoe[3] (2018). **USES:** Maize crop residues are used as organic fertilizer and livestock fodder. The use of maize residues as fuel is very limited. **PRICES:** There is practically no market of maize residues in Ukraine. One can expect the price of baled stalks to be close to that of baled straw.

[2] Crop production of Ukraine 2018. Statistical Yearbook by the State Statistics Service of Ukraine http://www.ukrstat.gov.ua/

[3] Assessment by UABIO.

Agricultural residues	
Sunflower crop residues (stalks, heads)	**SUNFLOWER CULTIVATION:** Ukraine is the European and world leader in the production of sunflower. In 2018, the sown area under sunflower in Ukraine was 6,117.1 Kha (22% of the total sown area), and the production came to 14,165.2 Kt[2]. **GEOGRAPHICAL DISTRIBUTION:** Sunflower cultivation has more density in eastern and southern regions of Ukraine (Dnipropetrovsk, Kharkiv, Kirovograd regions in particular) but it takes place in all the regions of Ukraine. The least production is in Zakarpattia region (West of Ukraine), the sawn area under sunflower being only 2.7 Kha (2018)[2]. **ESTIMATION OF BIOMASS PRODUCTION:** Potential of residues of sunflower production (stalks, heads) is assessed as 1.5 Mtoe[3] (2018). **USES:** Sunflower crop residues are used as organic fertilizer and livestock fodder. **PRICES:** There is practically no market of sunflower residues in Ukraine.
Olive tree prunings	**OLIVE TREE CULTIVATION:** Not available in Ukraine.
Other fruit tree prunings	**FRUIT TREE CULTIVATION:** in 2018, the area of the fruit trees plantation (apple, pear, quince, plum, sour cherry, cherry, apricot, peach) in bearing age was 179.8 Kha, and the production came to 2,433 Kt[1]. **GEOGRAPHICAL DISTRIBUTION:** Fruit tree cultivation takes place in all Ukraine's regions, the largest areas of plantations being in Vinnytsa region (central Ukraine), Chernivtsi, Zakarpattia, Lviv regions (West of Ukraine) and Dnipropetrovsk region (East of Ukraine). **ESTIMATION OF BIOMASS PRODUCTION**: The potential of fruit tree pruning is assessed as nearly 81 ktoe/year[2]. **USES:** Prunings from fruit trees are mainly unused and burned in the open as waste.

Agricultural residues	
Vineyard prunings	**VINEYARDS:** In 2018, the area of vineyards was 43 Kha, including 40.7 Kha of the plantations in bearing age. The production of grapes came to 467.6 Kt[1]. **GEOGRAPHICAL DISTRIBUTION:** Cultivation of grapes is concentrated mainly in several regions: Odesa region (the biggest area of plantations that makes up 62% of the total vineyard area), Mykolaiv, Kherson regions (South of Ukraine), and Zakarpattia region (East of Ukraine). Other regions have very little production or do not cultivate grape at all. **ESTIMATION OF BIOMASS PRODUCTION**: The potential of vineyard prunings is assessed as about 22 ktoe/year[2]. **USES:** Prunings from vineyards are mainly unused and burned in the open as waste.
Cleaning of mountain/hilly pastures, meadows	**MEADOWS/PASTURES:** The area of hayfields in Ukraine is 5.5% (2,294.4 Kha) of the total agricultural land (41,329 Kha in 2018). This figure for pastures is about 13% (5,282.6 Kha)[4]. The hayfields and pastures are rarely mountain or hilly. **GEOGRAPHICAL DISRIBUTION**: All Ukrainian regions have substantial hayfields and/or pastures, the biggest areas (hayfields + pastures) being in Chernihiv and Sumy regions (North of Ukraine), Lviv region (West of Ukraine) and Kharkiv region (East of Ukraine). **USES:** Hay is used as livestock fodder and is not used for energy. **PRICES:** Hay is harvested mostly in the form of small bales. The prices of hay are contractual (not publicly available) and therefore difficult to determine.

[4] Data from the State Geo-Cadastre obtained through the State Statistics Service of Ukraine (letter of 16.08.2019).

Agro-industrial residues

Agro-industrial residues	
Sunflower Husks	**SUNFLOWER CULTIVATION:** Ukraine is the European and world leader in the production of sunflower. In 2018, the sown area under sunflower in Ukraine was 6,117.1 Kha (22% of the total sown area), and the production came to 14,165.2 Kt[2]. **GEOGRAPHICAL DISTRIBUTION:** Sunflower cultivation has more density in eastern and southern regions of Ukraine (Dnipropetrovsk, Kharkiv, Kirovograd regions in particular) but it takes place in all the regions of Ukraine. Processing of sunflower with the production of oil and generation of husk takes place at oil-extraction plant and other food industry enterprises which are available not in all Ukraine's regions. The biggest processing capacities are located in Odesa, Mykolaiv regions (South of Ukraine), Kirovohrad, Vinnytsia regions (central Ukraine) and Zaporizhia region (East of Ukraine). **ESTIMATION OF BIOMASS PRODUCTION:** Potential of sunflower husk is assessed as 1005 Ktoe[3] (2018). **USES:** Sunflower husk is actively used for the production of pellets/briquettes and for the production of energy at oil-extraction plants. Consumption of sunflower husk is estimated as 1500 Kt (626 ktoe) in 2017[3]. **PRICES:** Starting price of sunflower husk pellets/briquettes is about 60 EUR/t.
Rice Husks	**RICE CULTIVATION:** Rice production is a minor part of cereal crop cultivation is Ukraine. Sown area under rice was only 12.6 Kha in 2018 with the total production of 69.2 Kt. **GEOGRAPHICAL DISTRIBUTION:** Rice is produced practically only in two southern regions of Ukraine – Odesa and Kherson regions. **ESTIMATION OF BIOMASS PRODUCTION:** Potential of rice husks is assessed as 5 Ktoe[3] (2018). **USES:** Some amount of rice husk is used for the production of briquettes (mainly in Odesa and Kherson regions); the rest is unused. **PRICES:** The price of rice husk briquettes is about 75 EUR/t. The prices of rice husk are contractual (not publicly available) and therefore difficult to determine.
Olive stones	Not available in Ukraine
Exhausted olive cake	Not available in Ukraine

Agro-industrial residues	
Nut shells (almonds, walnuts, pistachios, etc.)	Not available (collected) in Ukraine.
Other fruit stone (e.g. Peach)	Not available (collected) in Ukraine.

Energy crops

Energy crops	
Woody varieties - SRC (Poplar, Willow, Robinia, etc.)	**Willow**: 4,200 ha (in 2017)[5]. **Poplar**: 175 ha (in 2018)[3]. **Alternative uses:** no alternative uses for energy crops except for the production of biofuels and energy.
Grassy Varieties (ARUNDO DONAX, Miscanthus, Switch grass, etc.)	**Miscanthus**: 520 ha (in 2017)[5]. **Sorghum**: 80 ha (in 2017)[5]. **Alternative uses:** no alternative uses for energy crops except for the production of biofuels and energy. Sorghum as an agricultural crop is cultivated on 41.9 Kha[6] (2018) for food and fodder production.

[5] Ukraine's Progress Report On The Promotion And Use Of Energy From Renewable Sources in Ukraine in the years of 2016-2017 https://www.energy-community.org/documents/reports.html
[6] Data from the Ministry of Agrarian Policy and Food of Ukraine. Letter N 37-16-16/15979 of 24.07.2019.

Table 1: Technical potential of agricultural and agro-industrial residues in Ukraine, ktoe (2018)

Country, regions	Agricultural residues					Agro-industrial residues		TOTAL***
	Straw of cereals	Maize crop residues (stalks, cobs)	Sunflower crop residues (stalks, heads)	Fruit tree pruning	Vineyard pruning	Sunflower husk	Rice husk	
Ukraine	**3360**	**3558**	**1543**	**80.5**	**21.9**	**1005**	**5***	**9573**
Regions:								
Vinnytsa	213	373	88	10.0	0.05	105		**789**
Volyn	95	29	8	1.3	0.00	0.00		**133**
Dnipropetrivsk	210	132	140	5.3	0.16	68		**555**
Donetsk	114	18	58	2.4	0.16	33		**226**
Zhytomyr	92	150	33	1.3	0.00	0.00		**276**
Zakarpattia	10	27	0.6	6.1	1.83	0.00		**46**
Zaporizhia	208	13	78	3.0	0.22	123**		**425**
Ivano-Frankivsk	47	33	6	3.3	0.05	0.00		**89**
Kyiv	123	281	62	3.0	0.05	30		**499**
Kirovohrad	145	225	159	1.9	0.05	138		**669**
Luhansk	94	23	79	1.9	0.05	11		**209**
Lviv	106	36	20	5.6	0.05	29		**197**
Mykolaiv	202	57	118	2.1	2.90	101		**483**
Odesa	346	71	97	3.4	13.55	148**		**679**
Poltava	139	490	103	2.2	0.05	48		**782**
Rivne	76	47	6	2.8	0.00	0.00		**132**
Sumy	119	325	68	1.0	0.00	0.00		**513**
Ternopil	157	100	21	2.2	0.00	0.00		**280**
Kharkiv	236	142	160	2.3	0.05	58		**598**
Kherson	194	29	60	3.5	2.53	33		**322**
Khmelnytskyi	172	209	53	5.9	0.00	0.00		**440**
Cherkasy	127	334	70	2.1	0.05	14		**547**
Chernivtsi	25	33	6	6.6	0.05	24		**95**
Chernihiv	107	382	63	1.1	0.00	0.00**		**553**

** Data on the amount of rice husk in regions are not available.*

*** Figure is not precise (actually, it is bigger) as data on capacity of some oil-extraction enterprises are not available.*

**** Total for regions without rice husks.*

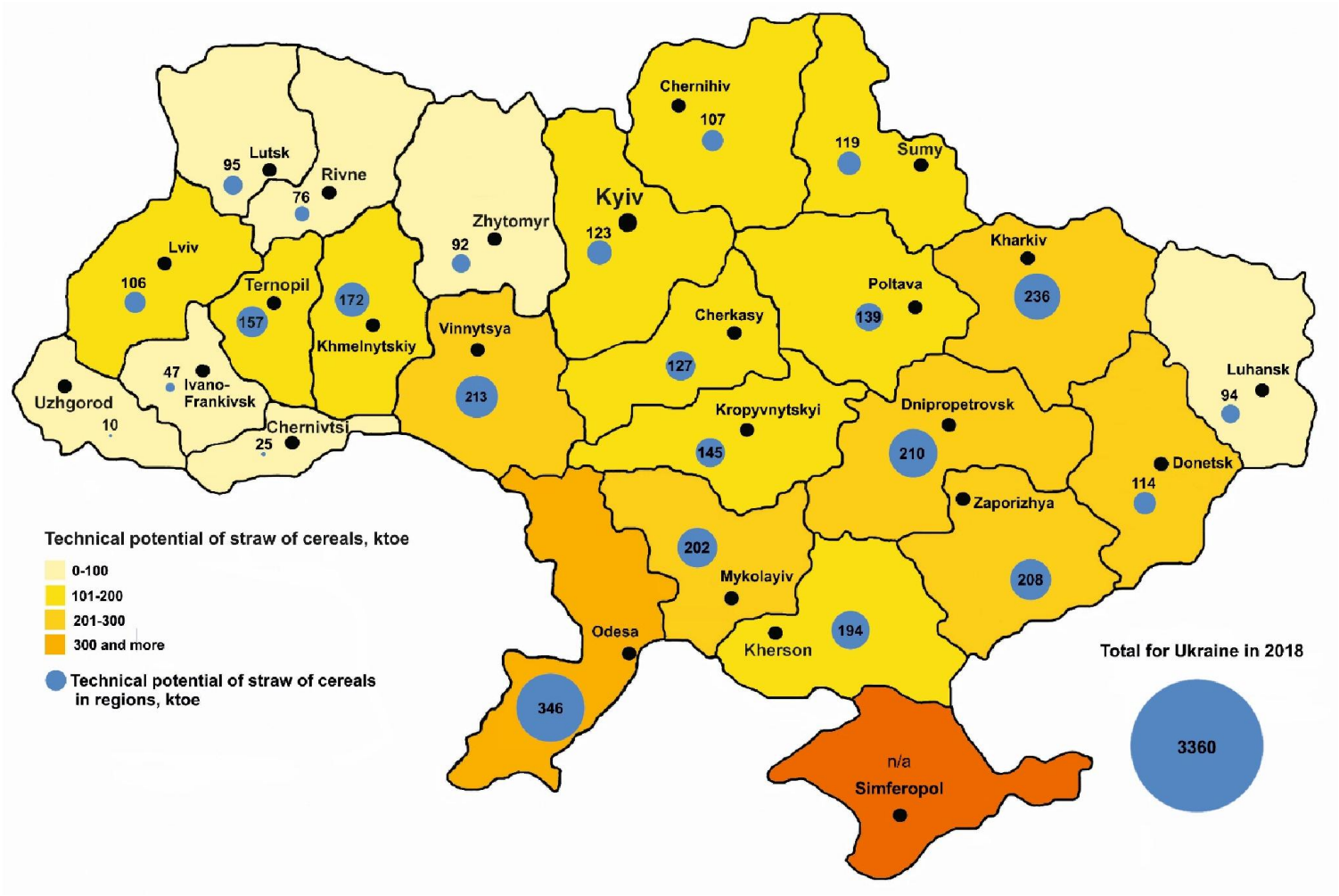

Figure 1: Technical potential of cereal straw in Ukraine.

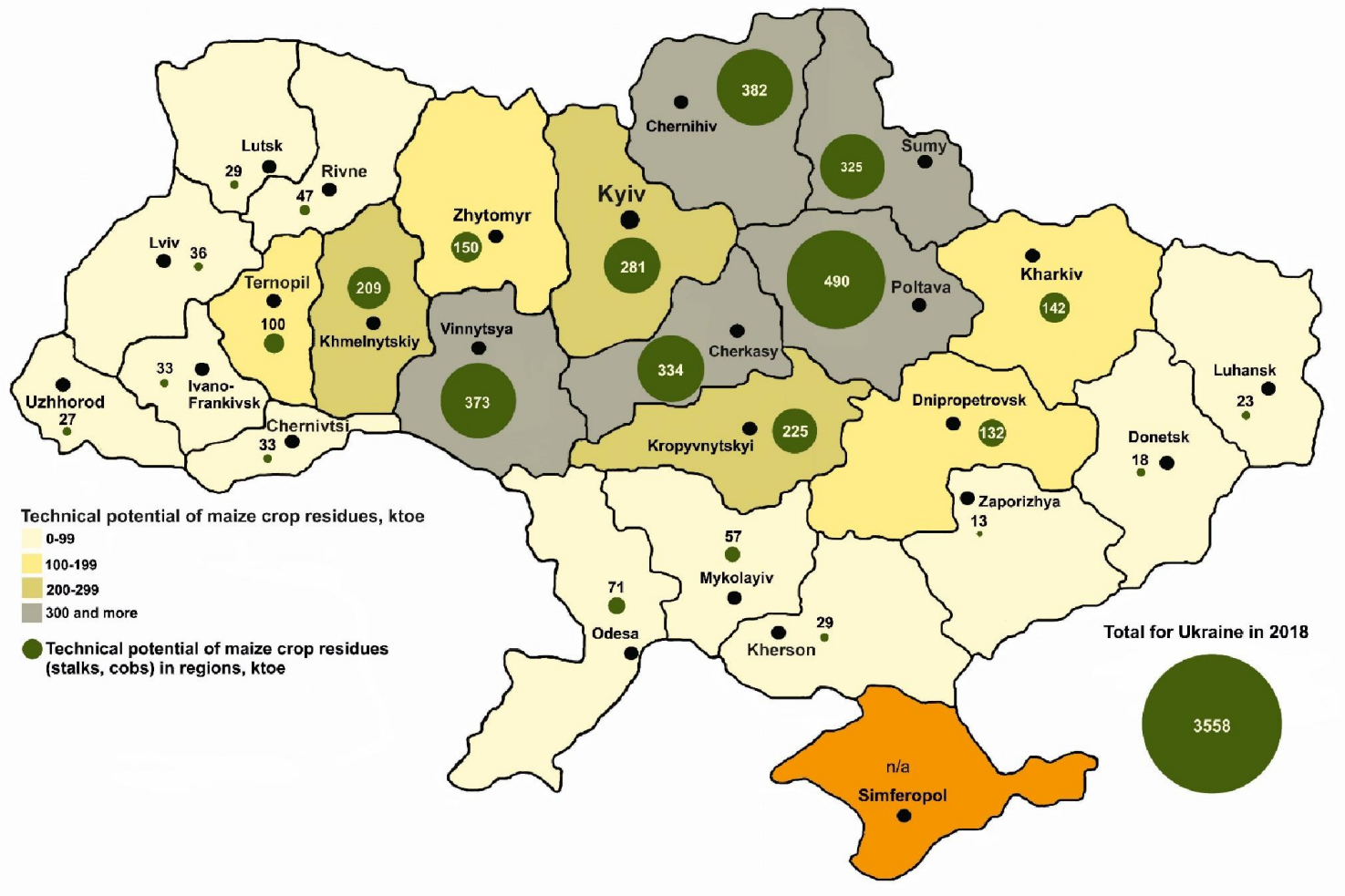

Figure 2: Technical potential of maize crop residues in Ukraine.

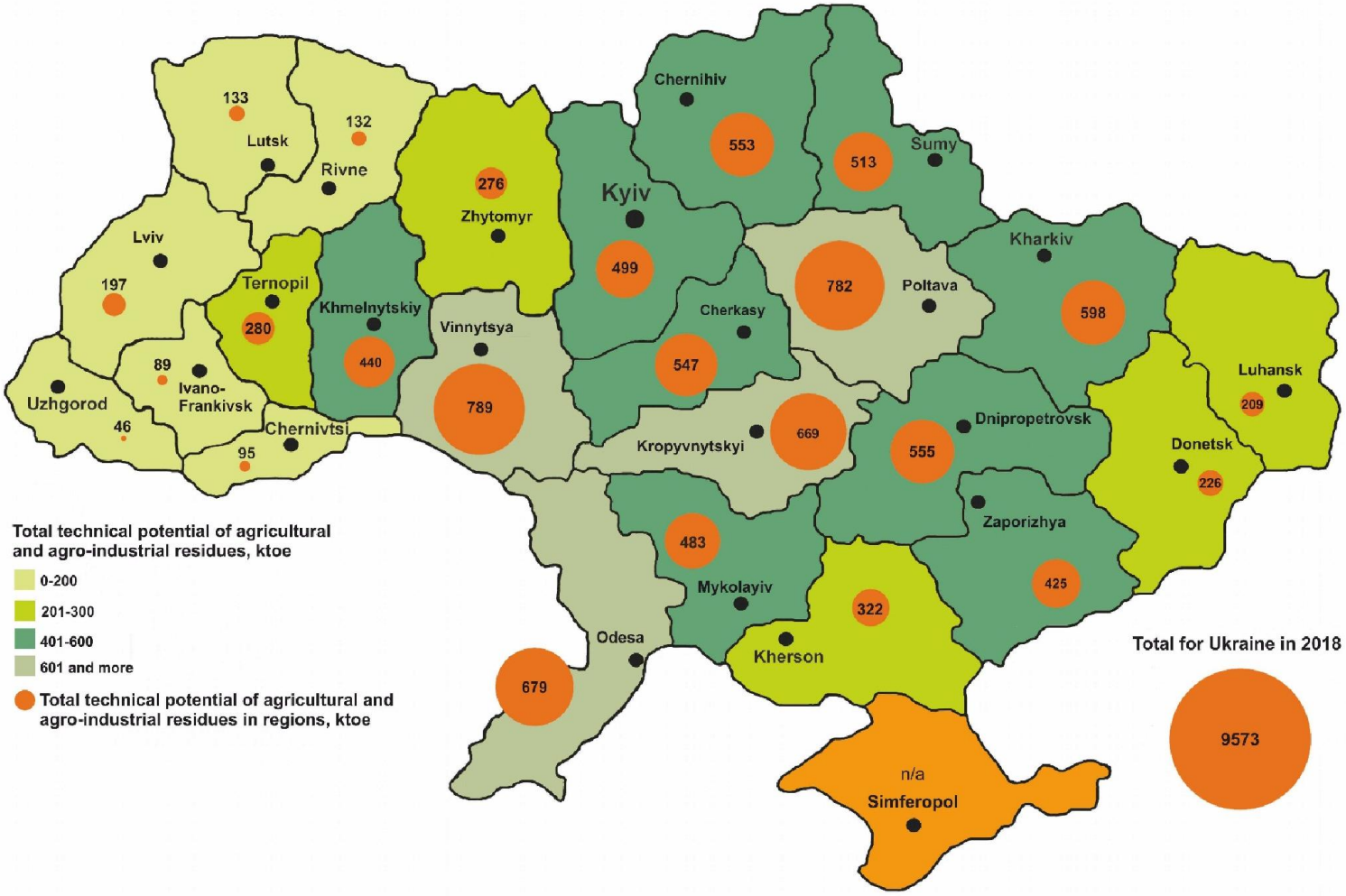

Figure 3: Technical potential of agricultural and agro-industrial residues in Ukraine.

2. Rural Development

Rural Development	
How is Rural Development managed?	Rural Development policy in Ukraine is managed on centralised and decentralised bases. Centralised policy reflects national strategies stated in the State Strategy for Regional Development until 2020[7] and the Concept for Rural Areas development[8]. Decentralised policy is implemented by 24 state regional administrations through Rural Development Strategies (RDSs) coordinated with the State Strategy for Regional Development until 2020. The RDSs are funded under the State Regional Development Fund and national contributions. The RDSs set out priority approaches and actions to meet the needs of the specific geographical area they cover.
Are agrobiomass feedstocks suitable for bioheat included in the Ecological Focus Area? (for example, Short Rotation Coppice, Miscanthus, Silphium perfoliatum)	No. Energy crops are cultivated only on underutilized agricultural land.
Are there any restrictions on the cultivation of dedicated energy crops (woody or grassy varieties)?	Dedicated energy crops can be cultivated on condition that they are included in the State Register of plant varieties suitable for dissemination in Ukraine[9].
Are there any restrictions or mandated practices covering agricultural residues collection?	No.
Is there any support for the valorization of agricultural residues at national level? Or at local level?	No.
Is there a ban on burning stubbles, prunings or other agricultural residues?	The burning of crop remains in the fields is strictly **prohibited** by the legislation of Ukraine. Thus, administrative liability (in the form of a fine) and even criminal liability (in the form of custodial restraint/imprisonment) is envisaged for: • «**Destruction** or impairment of forests, plantations around the settlements and along railways, as well

[7] Approved by Resolution of the Cabinet of Ministers N 385 of 06.08.2014 https://zakon.rada.gov.ua/laws/show/385-2014-%D0%BF#n11

[8] Approved by Resolution of the Cabinet of Ministers N 995-p of 23.09.2015 https://zakon.rada.gov.ua/laws/show/995-2015-%D1%80

[9] https://sops.gov.ua/reestr-sortiv-roslin

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 818369.

Rural Development	
	as **stubble remains**, dry wild grass, vegetation or its **residues on agricultural land by fire** or any other generally dangerous way ..." (Article 245 of the Criminal Code of Ukraine "Destruction or damage of objects of the vegetable world"[10]). • «**Burning of stubble remains**, meadows, pastures, plots of steppe, wetland and other natural vegetation, burning of vegetation or its **residues** and fallen leaves **on agricultural land**, in shelterbelts of roads and railways, in parks and other green spaces, burning of lawns in settlements without permission or with violation of terms of permission of state control bodies in the field of environmental protection... "(Article 77^{-1} of the Code of Ukraine on Administrative Offenses "Unauthorized burning of vegetation or its residues"[11]).

[10] Criminal Code of Ukraine. Law № 2341-III of 05.04.2001 (amended)
https://zakon.rada.gov.ua/laws/show/2341-14
[11] Code of Ukraine on Administrative Offenses. Law № 8073-X of 07.12.1984 amended)
https://zakon.rada.gov.ua/laws/card/80731-10

3. Logistics and other market considerations

Logistics	
Are harvesters/balers for agricultural residues readily available in the market?	Harvesters of Ukrainian and foreign production and balers for cereal straw of foreign production are readily available in Ukrainian market. Balers for maize stalks are not manufactured in Ukraine and the balers of foreign make are not available in the market.
Is there an investment support available to cover the cost of these machines?	There is a state investment support available for enterprises to cover 40% of the cost of machines and equipment of domestic production intended for agricultural sector. The Ministry of Economic Development and Trade annually approves the list of this equipment[12]. Now among others, the list includes certain harvesters but does not include balers for cereal straw.
Are there any specialized service companies for agricultural residues harvesting and logistics?	Strictly speaking no. However, as usual large producers of pellets/heat from agro-biomass include their own companies (units) responsible for the biomass supply. These companies have specialized machinery for agro-biomass harvesting and logistics. Due to the present limited number of such companies in Ukraine (up to 10), their capability to provide biomass logistics services to other customers are very restricted. Generally speaking, biomass logistics sector is not well developed in Ukraine. There are several regional companies performing biomass logistics but this activity is not their core business.
How does the biomass market usually operate?	To date, the biofuel market in Ukraine remains poorly developed. There is no single platform for the realization of efficient purchases of different types of biomass/biofuels in required volumes and of required quality. This problem is especially acute for bioenergy projects using agro-biomass. On the one hand, to attract investments, the owner of such a project must confirm availability of suppliers to provide the required type of biomass in the required quantity. On the other hand, agricultural producers are ready to organize the collection, storage and supply of biomass only in case of availability of a real (not just potential) buyer (consumer). Actually, a buyer (consumer) shall look for a producer

[12] http://www.me.gov.ua/Documents/List?lang=uk-UA&id=db6ade26-b223-4214-9caf-b9f8b73b4d28&tag=KomisiiaZFormuvanniaPerelikuVitchiznianoiTekhnikiTaObladnanniaDliaAgropromislovogoKompleksu-VartistYakikhChastkovoKompensutsiaZaRakhunokKoshtivDerzhavnogoBiudzhetu

	(seller) of agro-biomass, negotiate a price and make a contract by himself.
Are there companies producing agro-pellets?	There are companies producing agro-pellets in Ukraine. Examples of some largest producers are[13]: "Aver-Tech" Ltd (pellets from cereals and rapeseed straw, Cherkasy region); "Vin-Peleta" Ltd (pellets from cereals and rapeseed straw, maize crop residues, alfalfa, Vinnytsia region); "Bioenergy-Vinnytsia" Ltd (pellets from cereals, rapeseed and soybean straw, maize crop residues, Vinnytsia region); Oil-extraction plant "Yuzhny" (pellets from sunflower husk, oilcakes and alfalfa).
Are there any resistance in the market for this kind of product?	Some problems associated with the production and sale of agro-pellets are: - lack of feedstock suppliers; - impossibility to conclude long-term feedstock supply contracts; - demand for pellets is seasonal; - quick deterioration of the equipment; - unstable quality of feedstock.

[13] Comprehensive analysis of the Ukrainian biomass pellets market. Prepared by SEC "Biomass" within a UNDP/GEF project, 2016
http://uabio.org/en/activity/uabio-analytics/3166-comprehensive-analysis-of-the-ukrainian-biomass-pellets-market

4. Air quality

Air quality	
Has the state submitted a NAPCP? (National Air Pollution Control Programme)	Ukraine has several national documents regulating air pollution issues: - National Plan for the reduction of emissions from large-scale combustion installations[14]; - Strategy for the state ecology policy until 2030[15]; - Law "On atmospheric air protection"[16]; - Law "On environmental protection"[17].
Competence over air quality related issues is at National or at Local level?	Competence is shared between national government that sets the limits and provides a framework and regional authorities. Regions have the obligation to monitor quality of air and put in place measures to respect the limits.
Are performance standards and/or emission limits a possible barrier to deployment of agrobiomass heating systems up to 500 kW?	No. In fact, emission limits are specified in such a way that installations <500 kW just do not fall within their scope.
Are performance standards and/or emission limits a possible barrier to deployment of agrobiomass heating systems from 500 kW to 1 MW?	No. If the installation includes a flue gas cleaning system, the emission limits can be met.

[14] Approved by Resolution of the Cabinet of Ministers N 796-p of 08.11.2017 https://zakon.rada.gov.ua/laws/show/796-2017-%D1%80
[15] Law of Ukraine N 2697-VIII of 28.02.2019 https://zakon.rada.gov.ua/laws/show/2697-19#n14
[16] Law of Ukraine N 2707-XII of 18.12.2017 https://zakon.rada.gov.ua/laws/show/2707-12
[17] Law of Ukraine N 1264-XII of 12.10.2018

5. Tax breaks

Tax breaks	
What is the VAT applicable to agrobiomass feedstock?	VAT for all types of agro-biomass feedstock is 20%.
For comparison, what is the standard VAT rate and the one applicable to fuels used for heating (e.g. heating oil, LPG, natural gas, firewood, pellets, etc.)?	20%
Are there any tax detraction on refurbishment of buildings/replacement of heating system that can be potentially applied to agrobiomass heating?	No

6. Other support measures targeting heating

Other support measures targeting heating	
Are there any rural development measure in place to support the production of bio-heat on-farm?	No
Are there national or local incentives to substitute old fossil fuel boilers (investment support)?	As mentioned earlier, there is a state investment support available for enterprises to cover 40% of the cost of machines and equipment of domestic production intended for agricultural sector. The Ministry of Economic Development and Trade annually approves the list of this equipment[12]. Among others, the list comprises certain heat generators and boilers including those running on biomass. Another instrument support is a stimulating tariff for heat produced from biomass. This tariff is applied for economic entities that produce heat from biomass for population and state-financed institutions. The stimulating tariff is 90% of the tariff for heat produced from natural gas.
Are they applicable to agrobiomass heating solutions?	Yes.
Are there any specific measures in support of energy communities / renewable energy cooperatives that could be applicable to agrobiomass heating?	No

7. Buildings Efficiency

Buildings Efficiency	
Are there any incentives to renovate buildings integrating renewable heat?	Within the State Program on **"Warm Credits"**, households can obtain 20% state compensation for credits taken for purchasing boilers operating on solid fuels including biomass.
Are agrobiomass systems eligible for support under such schemes?	Yes.

8. Policy Coherence

Policy Coherence	
Are policy instruments impacting agrobiomass designed in a coherent way?	
1. Soil considerations vs. Valorisation of residues	In 2018, the Cabinet of Ministers of Ukraine approved the Strategy for low-carbon development of Ukraine until 2050[18]. The Strategy envisages increasing use of different biofuels as well as improvement of soil condition in terms of organic matter content. However, it is **not** stated that soil organic carbon should be increased just by integration of agro-biomass residues into the soils.
2. Definition of waste vs. co-products/agri residues	There are some contradictions between the terms definitions in official documents in Ukraine. On the one hand, in the *Waste Classifier*[19], **straw, maize stalks and cobs, sunflower husk** are defined as **waste**. *National Strategy for waste management until 2030*[20] also refers to **straw** as a crop waste, which is a part of agricultural waste. On the other hand, the Nomenclature of Agricultural Products[21] defines **straw, maize stalks and cobs** as **by-products.** Additional confusion is caused by the fact that **straw/stalks** are defined as **waste** in Ukraine's *National Standard "Organic and organic-mineral fertilizers"*[22] while the document *"Use of straw and after-harvesting remains as organic fertilizers to increase humus content in soil (recommendations)"*[23] defines **straw/stalks** as **by-products** referring to the same Standard. Nevertheless, this situation has no impact on the collection/use of the mentioned agro-biomass. Some agro-experts have strong viewpoint that all straw, stalks, cobs

[18] https://unfccc.int/sites/default/files/resource/Ukraine_LEDS_en.pdf (in English)
https://menr.gov.ua/files/docs/Proekt/LEDS_ua_last.pdf (in Ukrainian)
[19] Waste Classifier DK 005-96 approved by Resolution of the State Standardization Committee N 89 of 29.02.1996 (with amendments) https://zakon.rada.gov.ua/rada/show/v0089217-96
[20] National Strategy for waste management until 2030. Approved by Resolution of the Cabinet of Ministers N 820-p of 08.11.2017 https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80
[21] Nomenclature of Agricultural Products. Approved by the Resolution of the State Statistics Service of Ukraine N 300 of 15.10.2014 https://zakon.rada.gov.ua/rada/show/v0300832-14
[22] Ukraine's National Standard "Organic and organic-mineral fertilizers. Terms and definition of names. DSTU 4884:2007".
[23] The document was prepared by a group of Ukrainian experts from four core institutes under umbrella of the Ministry of Agrarian Policy and Food and the National Academy of Agrarian Sciences (2012).

Policy Coherence	
	and other similar agro-biomass should be used as organic fertilizer and/or fodder/litter for animals. However, this point of view has nothing to do with the existing definitions of terms and is explained by necessity to improve soil condition in Ukraine.
3. Is the Common Agricultural Policy Strategic plan being developed in harmony with the National Energy and Climate Plan?	Ukraine does not have the Common Agricultural Policy Strategic plan; however, it has the Strategy for agrarian economy development until 2020[24]. The Strategy envisages priority production of biofuels from plants that are not used for food and feed, as well as increase in soil fertility. Regarding the status of NECP, see item **4** below.
4. NECPs: 5 dimensions are developed in harmony?	National Energy and Climate Plan for Ukraine is now under development with the assistance of some German experts[25]. Final draft of the Plan to be submitted to the Energy Community is expected in February-March 2020[26]. According to Governmental Resolution of 06.12.2017[27], NECP should be approved in 2020.
5. Is there a national bioeconomy strategy? Are there any measures targeting agrobiomass for energy? Are those measures coherent with rural development and energy and climate related policies?	There is no national bioeconomy strategy in Ukraine. Measures targeting agro-biomass for energy include the stimulating tariff for heat; partial compensation of costs of certain biomass heat generators and boilers of domestic manufacture and "Warm Credits" for households (these measures were described in respective items above). We consider these measures to be coherent with the rural development and energy and climate related policies.

[24] Strategy for agrarian economy development until 2020. Approved by Resolution of the Cabinet of Ministers N 806-p of 17.10.2013 https://zakon.rada.gov.ua/laws/show/806-2013-%D1%80
[25] https://lowcarbonukraine.com/2019/03/26/policy-paper-2/
[26] https://lowcarbonukraine.com/wp-content/uploads/2019/03/PP2_03_2019_NECP.pdf
[27] Action Plan for implementing the Conception of state policy on climate change until 2030. Approved by Resolution of the Cabinet of Ministers No 878-p of 06.12.2017
https://zakon.rada.gov.ua/laws/main/878-2017-%D1%80