Brief characteristic of the land plots selected for the construction of facilities, oscillating and transporting capacities of the on-grid solar and wind power plants in Zhyvachiv, Tlumach district, Ivano-Frankivsk Oblast, Ukraine.

Total area of the land plot in Zhyvachiv, upon which the oscillating capacities and the constructions of the renewable energy facilities can be placed, is 84 ha. The planned capacity of the first stage of a SPP is 4,72 MW. Maximum capacity of the project is 66,72 MW.

The state owned lands are leased by PE «Germes-2». The designation of the leased land plots is changed from agricultural lands to lands for deployment of energetic facilities. The land plot has a pronounced south-east slope (15-30° canting angle). The top of the hill is suitable for construction of wind power plant additionally to solar power plant that allows construction of a hybrid energy park.

Average height of the plot location equals 342 meters above sea level. The plot borders by the highway of regional significance P-20 that starts in Snyatyn passes through Horodenka and leads to the regional center Ivano-Frankivsk crossing the highways of national significance H-10, H-18 and H-09 as well as the highway of regional significance P-24.

To get acquainted with the plot in Zhyvachiv on the satellite map, use the following link: https://goo.gl/ZTtxZk
Fig. 1. The scheme of the 84 ha land plot for construction of the first stage of a SPP (15 ha, cadastral number: 2625683701:03:007:0369) and extension of a SPP/WPP (69 ha, cadastral numbers: 2625683700:01:001:0001, 2625683700:01:001:0002, 2625683700:01:001:0003, 2625683700:01:001:0004, 2625683700:01:001:0005, 2625683700:01:001:0006, 2625683700:01:001:0007)

Deployment of electricity-transporting lines
Along the highway P-20 on the border of the plot runs OTL 35 kV. On the opposite side of highway P-20 parallel to OTL 35 kV extends OTL 10 kV. OTL 110 kV extends in the Rivnychky stow tangent to the plot. At the distance of 3080 m away from the plot there is a functioning TS 35/10 kV “Ozeryany” belonging to the United Energetic System of Ukraine.

Fig. 2. The scheme of the overhead high-voltage lines in Zhyvachiv and Oleshiv

According to the grid connection conditions (technical conditions), issued by the regional grid operator Prykarpattyoblenerho for SPP/WPP-Zhyvachiv, the first stage of a SPP (nominal capacity – 4.72 MW, peak capacity – 5 MW) will be connected to OTL-35 kV, which runs alongside the border of the land plot, by means of installation of a recloser on the pole of OTL-35 kV. The cost of the connection of the first stage is approximately 50 thou EUR.
The potential of extension of the renewable energy facility in Zhyvachiv

After the construction of the first stage of a solar power plant with the nominal capacity of 4.72 MW (peak capacity – 5 MW) it will be possible to construct the second stage (extension to 9.72 MW) and the third stage (40 MW SPP and 22 MW WPP) upon condition of construction of TS 110/10 kV. With the purpose of extension of a SPP three additional operating companies (Zhyvachivenergo, LLC; Zhyvachivecoenergy, LLC; Zhyvachivenergobud, LLC) were established. Each of these companies has leased a 18 ha land plot (see cadastral numbers in description for Fig. 1). Feasibility study for extension to 40 MW was developed and sent to grid operator. Acquisition of technical conditions for extension to 40 MW (9.95 MW for each additional operating company) and pre-PPAs for each operating company is expected by the end of October 2018. Furthermore, in prospect additional deployment of wind generators may be considered after additional examinations and measurements. See Fig. 3 for the scheme of split of the 84 ha land plot among the companies.
Fig. 3. The split of the land plot with total area of 84 for stage-by-stage construction of a SPP/WPP
Information about the operating company for the 1st stage of a SPP
PE «Germes-2»

Business identifier code: 34960865;
Location: Ivano-Frankivsk region, Tlumach district, Zhyvachiv, 28A\4 Nezalezhnosti Street;
Director: Volodymyr Palahniuk;
Institutional sector of economy - 5.11002 Private non-financial corporation;
Types of activity according to CISE-2010:
35.11 Electrical power generation;
35.12 Electrical power transmission;
35.13 Electricity distribution;
35.14 Electricity trade;
41.20 Construction of domestic and non-domestic buildings;
42.22 Construction of electricity-supplying and telecommunicating facilities;

Private enterprise «Germes-2» was founded on April 26, 2007 and registered in National Registry under register entry number: 1 110 102 0000 000495, dated April 26, 2007 by Kolomyia District State Administration in in Ivano-Frankivsk region.
Brief characteristic of the land plots selected for the construction of facilities, oscillating and transporting capacities of the on-grid solar and wind power plants in Lanchyn, Nadvirna district, Ivano-Frankivsk oblast, Ukraine.

The land plot in Lanchyn selected for construction and operation of the first and second stages of a SPP has a total area of 40 ha. The planned capacity of the first stage of a SPP is 9.5 MW. It is possible to extend the capacity of the second stage of a SPP to 19 MW. Using available settlement reserve lands and electricity-transporting lines which run through the land plot, it is possible to construct a total of 98.88 MW SPP/WPP. Lanchynenergobud, LLC has acquired grid connection conditions (technical conditions) for connection of 9.5 MW SPP to the United Energetic System of Ukraine. Lanchynenerhobud, LLC has submitted documents to acquire pre-PPA which is expected shortly. The second stage of SPP-Lanchyn (additional 9.5 MW, 20 ha) is expected to be ready for designing by the end of October 2018.

The state owned lands of agricultural designation, of little value for farming purposes, are located within the settlement limits and are on lease at TOV (LLC) «Lanchynenergobud». The land plot has a pronounced south slope and is located at a distance of 1.5 km from the highway of territorial significance T-0905 which starts in Deliatyn, Nadvirna region and leads through Lanchyn to the district center – Kolomyia. Furthermore, it crosses the highways of national significance H-09 (Ivano-Frankivsk-Uzhgorod) and H-10 (Ivano-Frankivsk-Chernivtsi). The road, that leads directly to the land plot, has a solid surface and leads to the villages of Vyshnivtsi, Seredniy Maidan and Havrylivka.

Approximate height of the land plot above sea level is 380 m.

The cadastral numbers of the land plots for the first stage (20 ha) are 2624056200:03:005:0007 and 2624056200:03:005:0007.

To get acquainted with the land plot in Lanchyn on the satellite map, use the following link: https://goo.gl/kfye5r
Fig. 1. The scheme of the land plots for construction of the first and second stages of a SPP (19 MW, 40 ha)
Deployment of electricity-transporting lines
At a distance of 1460 m from the land plot there is the TS 35/10 kV «Lanchyn».

Fig. 1. Technical specifications of the TS 35/10 kV “Lanchyn”.

<table>
<thead>
<tr>
<th>№ п/п підстанції, рівні напруги обмоток трансформаторів, кВ</th>
</tr>
</thead>
<tbody>
<tr>
<td>186</td>
</tr>
</tbody>
</table>

Регіон, суб'єкт господарювання
Івано-Франківська область, ПАТ Прикарпаттяобленерго

Номінальна потужність підстанції, Sном., кВА
8000

Максимально допустима потужність підстанції, P макс., кВт
5152

Електричне навантаження в режимний день, P реж.день, кВт
5200
According to the grid connection conditions (technical conditions), the busbars of **TS-35/10 kV “Lanchyn”** will be used for forwarding 9.5 MW of generated electricity. Cost of connection to the grid for the first stage of a SPP is approximately 20 000 EUR/1 MW. Also, to the north from the land plot runs the transit **OTL 110 kV Nadvirna-Kolomyia** which allows to extend generating capacities of a SPP/WPP in stages up to 98.88 MW.

**Potential of extension of the renewable energy facility**

Using settlement reserve lands that have direct access to the transit **OTL 110 kV Nadvirna-Kolomyia** it is possible to extend capacity of a SPP/WPP. For this purpose, it is necessary to construct a 110/10 kV substation with a 62 MVA transformer and connect it to the transit **OTL 110 kV Nadvirna-Kolomyia**. To extend capacity to over 80 MW it is needed to mount an additional transformer in the 110/10 kV substation.

Furthermore, availability of **OTL 110 kV Nadvirna-Yabluniv** allows additional deployment of generating capacities with connection to these lines after development of feasibility study.

**Information about the operating company for the 1st stage of SPP**

**TOV (LLC) «Lanchynenergobud»**
Business identifier code: 41541428
Location: Ivano-Frankivsk region, Nadvirna district, Lanchyn, 93 Nazariia Yaremchuka St.;
Director: Volodymyr Palahniuk;
Institutional sector of economy - 5.11002 Private non-financial corporation;
Types of activity according to CISE-2010:
35.11 Electricity production;
35.12 Electricity transmission;
35.13 Electricity distribution;
35.14 Electricity trade;
41.20 Construction of domestic and non-domestic buildings;
42.22 Construction of electricity-supplying and telecommunicating facilities;

Limited liability company «Lanchynenergobud» was founded on August 23, 2017 and registered in National Registry under register entry number: 11211020000003512.
Brief characteristic of the land plots selected for the construction of facilities, oscillating and transporting capacities of the on-grid solar power plant

The town council of Monastyryska (Ternopil region, Ukraine) has decided to grant TOV (LLC) Monastyryskenerho and TOV (LLC) Monastyryskenerhobud 4 land plots with total area of 37 ha on long-term lease. It is envisaged to construct 19,8 MW SPP on the above-mentioned land plots. Grid connection conditions (technical conditions) and land lease agreements were obtained and registered for these land plots. For implementation of the project two operating companies were established – TOV (LLC) Monastyryskenerhobud (17 ha leased, grid connection conditions for 9,9 MW) and TOV (LLC) Monastyryskenerho (20 ha leased, grid connection conditions for 9,9 MW).

The state owned land plots are leased by TOV (LLC) Monastyryskenerhobud (10 ha, cadastral number: 6124210100:04:001:0978; 7 ha, cadastral number: 6124210100:04:001:0979) and TOV (LLC) Monastyryskenerho (two bordering land plots, 10 ha each, cadastral numbers: 6124210100:03:001:0969 and 6124210100:03:001:0970). Designation of all land plots was changed to “14.01 For deployment, construction, operation and maintenance of facilities of electricity-producing enterprises”. Both operating companies (Monastyryskenerhobud and Monastyryskenerho) have applied for acquisition of pre-PPA which is expected shortly.

The land plot for the first stage of a SPP is located at the town limit of Monastyryska and borders on the detour road which leads to the T-02-04 highway (Berezhany–Pidhayci–Monastyrynska). T-02-04 crosses the highway of national significance H-18 (Ivano-Frankivsk–Buchach–Ternopil) and the highway of international significance M-12 (Stryi–Ternopil–Kirovohrad).

To get acquainted with the plot in Monastyryska on the satellite map, use the following link: https://goo.gl/JWWmn2
Fig. 1. The scheme of the plot selected for construction of the first stage of a SPP in Monastyrksa
**Deployment of electricity-transporting lines**

At a distance of 640 m from the land plot for the first stage of a SPP there is a TS-110/35/10 kV “Monastyryska” from which extend OTL-10 kV, OTL-35 kV and OTL 110 kV. OTL-10 kV runs along the south border of the land plot towards the village of Ridkolissia. OTL-35 kV runs parallel to OTL-10 kV at a distance of 170 from the land plot. OTL-110 kV runs to the north-west from the substation crossing the detour road of Monastyryska.

Fig.2. The scheme of deployment of OTL-10 kV, OTL-35 kV, OTL-110 kV and TS-110/35/10 kV

Land plots leased by TOV (LLC) Monastyryskenerho are located at a distance of 2.15 km to the south from TS-110/35/10 kV (see 1 and 2 at the bottom of fig.3).
Fig. 4. Land plots leased by TOV (LLC) Monastyrskenergo
The potential of extension of renewable energy facilities

After construction of the first stage of SPP with total capacity of 19.8 MW within the land plots with total area of 37 ha it will be possible to deploy additional 8 MW SPP using 16 ha land plot (cadastral number: 6124210100:01:001:2000) which is located at a distance of 700 m from TS 110/35/10 kV. Another land plot for extension has the area of 30 ha (see 4 at fig.5) and is located at a distance of 2.6 km from the land plot for the first stage of a SPP. Both land plots are located beyond the town limits of Monastyryska.

Such further enlargement of the area will allow to increase the capacity of renewable energy facilities by 50 MW. Performance capabilities of 110/35/10 kV Monastyryska substation allow to it convert the full envisaged capacity of the renewable energy facilities.
Fig. 5. Additional land plots (see 3 and 4) for further enlargement of area for construction of solar power plants.
Information about the project initiator companies

TOV (LLC) Monastyryskenenerho

Business identifier code: 42186443;
Location: 48300, Ternopil region, Monastyryska region, Monastyryska, 110 Volodymyra Velykoho St.:
CEO: Olexandr Bilan;
Institutional sector of economy - 5.11002 Private non-financial corporation;
Main type of activity according to CISE-2010: 35.11 Electricity production;
Limited liability company «Monastyryskenenerho» was founded on 5th June, 2018 and registered in National Registry under register entry number: 1 635 102 0000 000689.

TOV (LLC) Monastyryskenenerhobud

Business identifier code: 41926084;
Location: 48300, Ternopil region, Monastyryska region, Monastyryska, 10 Shevchenka St.:
CEO: Olha Bilan;
Institutional sector of economy - 5.11002 Private non-financial corporation;
Main type of activity according to CISE-2010: 35.11 Electricity production;
Limited liability company «Monastyryskenenerhobud» was founded on 8th February, 2018 and registered in National Registry under register entry number: 1 635 102 0000 000681.