Ukraine Sustainable Energy Lending Facility (USELF) Strategic Environmental Review (SER): Environmental Report

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Objectives of Strategic Environmental Review (SER)

- The European Bank for Reconstruction and Development (EBRD) launched the Ukraine Sustainable Energy Lending Facility (USELF)
- USELF commissioned a Strategic Environmental Review (SER) of renewable energy technologies in optimal areas of Ukraine
- The purpose of the SER is to lay out a path for later environmental reviews of specific renewable energy projects within Ukraine
- Types of renewable projects:

Biogas Biomass Small Hydro Solar Wind

SER Approach

- No Legislative requirement in Ukraine for SER
- EBRD Environmental and Social Policy requires compliance with EU Directives and national law for projects and programmes funded by EBRD
- SER aligned with EU SEA Directive (2001/42/EC), UK SEA Guidance and Ukraine OVNS
- The state of the environment in Ukraine has been described in SER Topic Papers (Appendix E) for each topic (e.g. water, landscape and biodiversity, etc)
- The SER uses objectives developed through scoping for each environmental topic to describe, analyse and compare environment effects

Energy Production in Ukraine

- The demand for electricity is expected to double between 2005 and 2030
- The majority of power generation relies on thermal power stations (64%), nuclear (26%) & large hydropower (9%).
- Renewable energy (excluding large hydro) accounts for <1%
- Government of Ukraine is seeking to significantly increase renewable energy capacity through the Green Tariff mechanism
- The SER is informed by five renewable energy reports (Appendix A) that assess scenarios of renewable energy development in Ukraine.

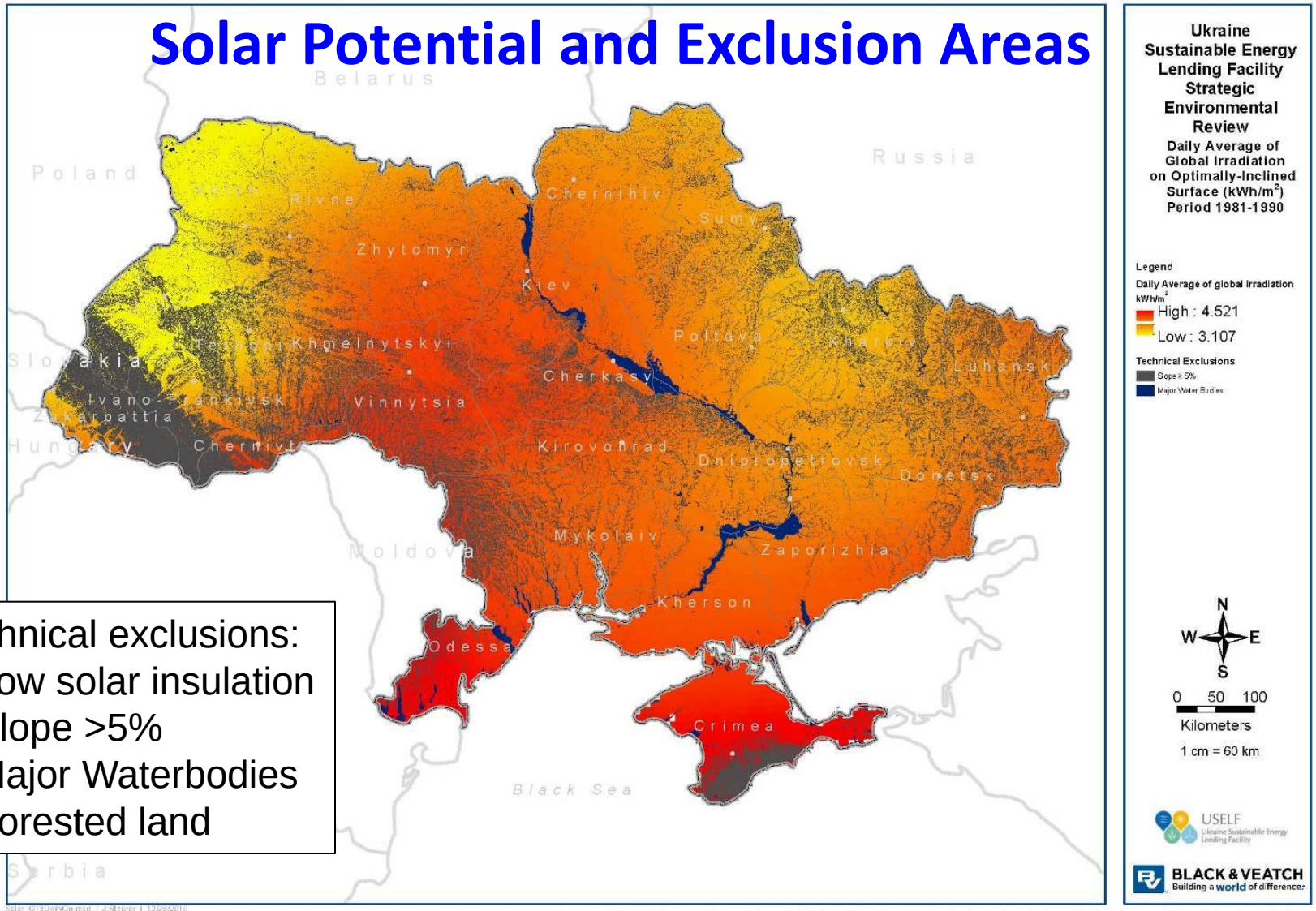
Assessment Scenarios

- The SER has developed five renewable energy scenarios to identify the potential significant environment effects.
- The scenarios consider:
  - Technology characteristics and likely construction activities;
  - Areas of good potential for renewables development;
  - Geographical constraints;
  - Existing infrastructure; and,
  - Transmission constraints
- An estimate of the potential scale of potential energy generation (MW) has been made for each scenario with a focus on those areas which are technically suitable for development

Assessment Scenarios (continued)

- Solar - Utility scale, ground-mounted solar farms ranging from 1MW to > 20MW
- Wind - Modern turbines (2- 3MW) in farms sizes of small <20MW to large >150MW)
- Small Hydro - Development of <10MW through new small impoundments or retrofit/rehab of retired or existing sites
- Biomass - Use of agricultural residues or wood residue for direct fire or Combined Heat and Power (CHP) plants of <5MW to >50MW
- Biogas - Use of animal manure or landfill gas to power 30Kw to 5 MW plants

Solar Potential and Exclusion Areas



Technical exclusions:

- Low solar insulation
- Slope >5%
- Major Waterbodies
- Forested land

Sources: PVGIS © European Communities, 2001-2008, International Centre for Tropical Agriculture (CIAT), DeLorme, ArcWorld Supplement, ESRI.

Policy Context and Baseline Environment

- The SER identifies the legislative and regulatory framework for renewable energy development and operation in Ukraine
- The SER has identified the current state and characteristics of the environment of Ukraine - the "Baseline".
- The Baseline is split into six Topic Areas:
  - Climate and air quality;
  - Surface and groundwater
  - Geology and soils
  - Landscape and biodiversity
  - Community and socio-economics
  - Cultural heritage

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Key Environmental Baseline Areas

Legend

- UNESCO Site
- Tentative UNESCO Site
- Protected Areas
- Index Contour
- Contour
- Supplemental Contour

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0 50 100
Kilometers
1 cm = 60 km

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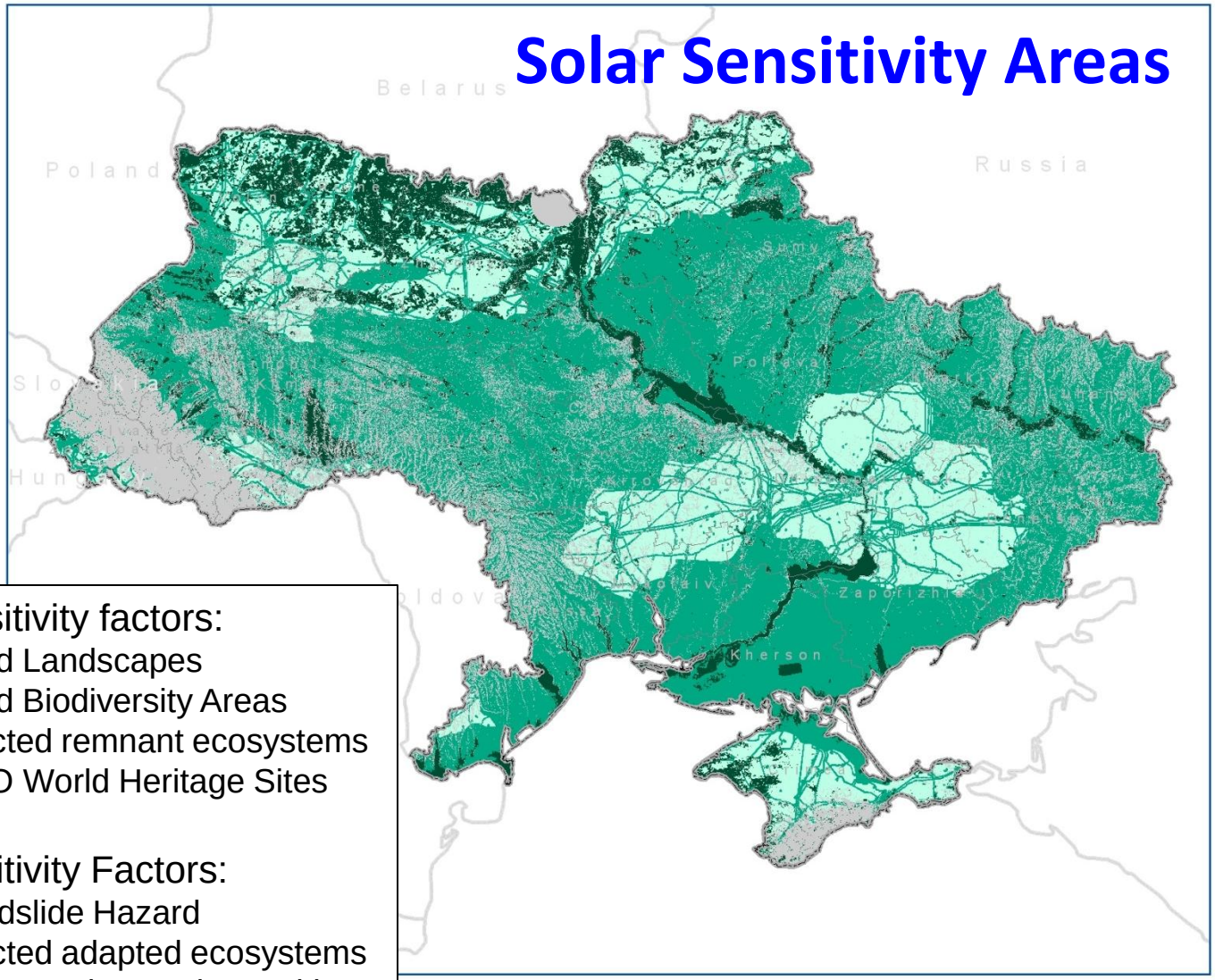
Data source: UNESCO, ESRI, IBAT, After C.A. Polyvach, National Atlas of Ukraine.

Spatial Constraints Analysis

- The SER provides a high-level analysis of environmental sensitivity to potential renewable energy projects
- Analysis is based on spatial data held in a Geographical Information system (GIS)
- The analysis has been carried out for each scenario and topic to provide an overall picture of technical, environmental and social constraints
- Development in highly sensitive areas is likely to require developers to demonstrate with certainty that impacts can be avoided or minimized to acceptable levels
- Further detailed assessment is required to identify project specific issues

Solar Sensitivity Areas



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Environmental Sensitivity and Technical Exclusions for Solar Development

Legend

Technical Exclusions

Sensitivity

Low

Medium

High

Data Sources: National Atlas of Ukraine; DeLorme; ArcWorld Supplement; SRTM; World Database on Protected Areas; MODIS

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High Sensitivity factors:

- Protected Landscapes
- Protected Biodiversity Areas
- Unprotected remnant ecosystems
- UNESCO World Heritage Sites

Low Sensitivity Factors:

- Low Landslide Hazard
- Unprotected adapted ecosystems
- Low value tourism and amenities

Likely Significant Effects on the Environment and Mitigation Measures

- Undertaken in line with EU SEA Directive
- Assessment by specialists for each topic area using expert judgment to consider if effects are significant based on:
  - Receptor value, vulnerability and sensitivity
  - Renewable scenario effects which can be direct or indirect, far-field, cumulative
  - The magnitude of the effects and their spatial extent
  - The probability of when or how long construction or operation effects would last for and whether they are permanent or temporary
  - Uncertainty over data, limitations or assumptions noted

Potentially Significant Effects and Mitigation - Solar

Potential effect	Mitigation
Positive socio-economic impact from employment, sustainable energy supply, and cumulative reduction of GHGs	• None required
Biodiversity impact during construction from loss of habitat and risk to flora and fauna from project footprint	• Ecological surveys and mitigation for species present • Avoidance by careful siting of project and ancillary infrastructure • Avoidance by careful timing of construction activities to avoid sensitive ecological seasons
Biodiversity impact of ancillary equipment resulting in animal strikes, barriers to movement, and disruption of migration patterns for wide-ranging species.	• Ecological surveys and mitigation for species present • Avoidance by careful siting of project and ancillary infrastructure • Avoidance by careful timing of construction activities to avoid sensitive ecological seasons • Bury transmission lines

Potentially Significant Effects and Mitigation – Solar

(continued)

Potential effect	Mitigation
Socio-economic impact during operation from loss of land/land-use	• Avoidance by siting on low sensitivity lands • Implement mitigation plans to improve livelihoods and standards of displaced persons • Provide compensation to displaced persons
Socio-economic impacts of nuisance (noise, dust, visual impact, traffic, etc) during construction	• Implement low impact construction techniques • Minimize impact by timing to low sensitivity periods. • Develop implementation plan in consultation with local community
Socio-economic impact to visual aesthetics during operation	• Avoidance by siting of solar photovoltaic development in low sensitivity landscapes • Use of natural (or artificial) screening where possible • Bury transmission lines
Soil erosion and degradation impacts during construction	• Prepare/Implement erosion control plan and best management practices

Implementation

Strategic Environmental Review
High Level Review to Identify Issues and Focus Scope & Required Mitigation

Address Project Issues
- National and International environmental requirements
- Technical & environmental constraints
- Data Availability
- Surveys & Monitoring
- Identify potential effects and mitigation

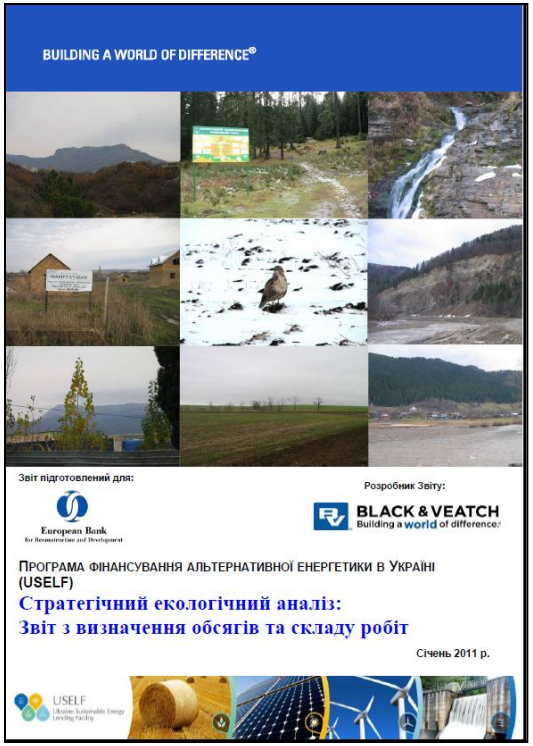
Demonstrate Compliance & Obtain Funding
- Environmental & Social Action Plan (ESAP)
- Stakeholder Engagement Plan (SEP)
- Non Technical Summary (NTS) of key environmental impacts and mitigation

SER Consultation

- Guided by the EU Strategic Environmental Assessment (SEA) Directive
- Stakeholder engagement and public consultation process is governed by:
  - EBRD's Environmental and Social Policy (2008)
  - EBRD's Public Information Policy (2008)
- Stakeholder Engagement Plan (SEP) has set out the nature, extent and timing of consultation with a wide range of stakeholder groups throughout the SER process.

SER Consultation (continued)

- The Draft SER Environmental Report is published for stakeholder comments and feedback
- Informed earlier through consultation on the SER Scoping Report and meetings with 51 stakeholders from 8 stakeholder groups
- Ukrainian and English versions of SER Environmental Report available
- USELF SER website: www.uself-ser.com
- Comments/feedback and other questions – please refer to the contact information on www.uself-ser.com



The Public Consultation Period for the USELF Strategic Environmental Review began 16 January, 2012 and will conclude on 17 May, 2012.

You can access the documents at ***www.uself-ser.com***

SER Public Consultation (120 days) → Review and Address Comments → Final SER Published (est. July 2012)

Please send written comments to Ivan Maximov at (maximovi@bv.com) or Serhiy Varlamov at (varlamovsergiy@mail.ru), or mail them to:
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THANK YOU!