DALEKOVOD

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obnovljivi izvori energije

/ renewable energy sources

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Obnovljivim izvorima energije (OIE) smatraju se izvori energije koji su sačuvani u prirodi i obnavljaju se u cijelosti ili djelomično, posebno energija vodotoka, vjetra, neakumulirana sunčeva energija, biogorivo, biomasa, bioplin, geotermalna energija, energija valova, energija plime i oseke, energija plina iz deponija ili postrojenja za preradu otpadnih voda.

/ Renewable energy sources (RES) are considered to be energy sources preserved in the nature and are renewed in whole or partly, especially the energy of water current, wind, non-accumulated solar energy, bio-fuel, biomass, biogas, geothermal energy, energy of waves, energy of tides, energy of gas from the waste disposals or plants for treatment of waste waters.

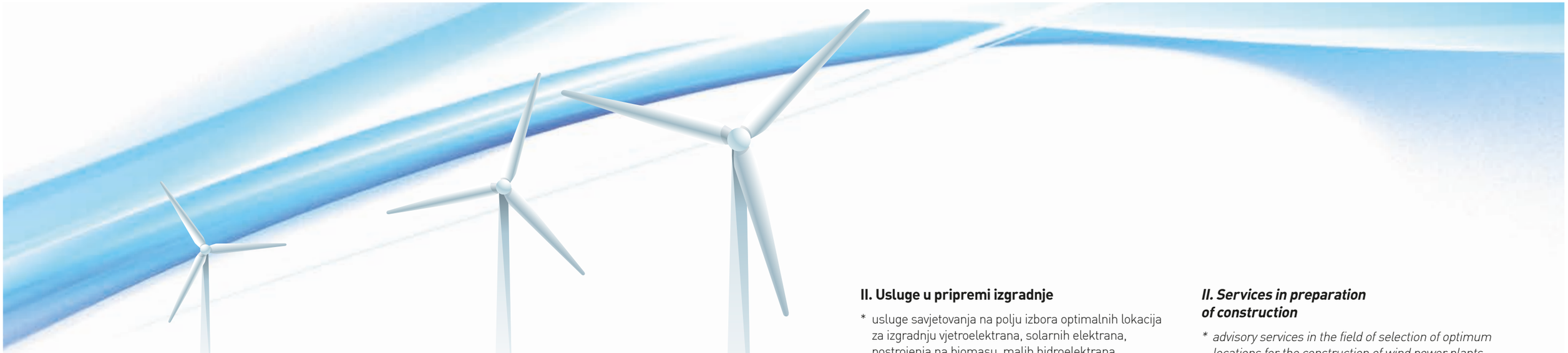
sadržaj / content

Razlozi za povećanje udjela OIE u sveukupnoj proizvodnji energije su između ostaloga:

* smanjenje emisije stakleničkih plinova te troškova proizašlih iz lokalnih i globalnih učinaka onečišćenja
* smanjenje onečišćenja koje utječe na zdravlje ljudi iz konvencionalnih postrojenja za proizvodnju električne energije i pripadnih troškova liječenja
* povećanje prihoda lokalnih zajednica kroz lokalno zapošljavanje i izgradnju infrastrukture
* povećanje sigurnosti opskrbe kroz diversifikaciju izvora i proizvodnih lokacija

/ The reasons for increasing the share of RES in total production of energy are the following:

* *decrease in emission of greenhouse gases and costs arising from local and global pollution effects*
* *decrease in pollution affecting the people's health coming from traditional plants for the production of electricity and accompanied treatment costs*
* *increase in income of local communities through local employment and construction of infrastructure*
* *greater safety of supply through diversification of resources and production locations*



dalekovod d.d. - usluge na području obnovljivih izvora energije

/dalekovod d.d. - services in the area of renewable energy sources

Dalekovod d.d se već nekoliko godina bavi razvojnim projektima usmjerenima k obnovljivim izvorima energije te je u tom kontekstu u suradnji s mrežom savjetnika, stručnjaka, tvrtki, fakulteta, instituta te podizvođača u izgradnji i montaži, u mogućnosti ponuditi pojedine specifične usluge u projektima vjetroelektrana, solarnih elektrana, projekata iskorištavanja biomase i malih hidroelektrana:

Dalekovod d.d has been for several years engaged in development projects focusing on renewable energy sources and in this respect it may in cooperation with a network of advisors, experts, companies, faculties, institutes and sub-contractors in construction and erection, offer specific services in projects regarding wind power plants, solar power plants, projects relating to using biomass and small hydro power plants:

I. Usluge savjetovanja i pregovori o ugovaranju plasmana električne energije i prilagođavanju novoj zakonskoj regulativi

* ekonomski, financijski i pravni savjeti
* posredovanje u formiranju kupoprodajnih ugovora za električnu energiju i ugovora o korištenju mrežne infrastrukture
* usluge savjetovanja u kontaktima s Hrvatskom energetskom regulatornom agencijom (HERA) nezavisnim operaterom sustava i tržišta te svim ostalim institucijama bitnim za pripremu izgradnje, izgradnju i rad elektroenergetskih objekata

I. Advisory services and negotiations about contracting placements of electricity and compliance with new legal regulations

* *economic, financial and legal advices*
* *mediation in agreeing on sales agreements for electricity and agreements of using the network infrastructure*
* *advising services in contacts with Croatian Energy Regulatory Agency (HERA) an independent operator of the system and market and all other institutions relevant for the preparation of construction, construction and operation of energy supply facilities*

II. Usluge u pripremi izgradnje

* usluge savjetovanja na polju izbora optimalnih lokacija za izgradnju vjetroelektrana, solarnih elektrana, postrojenja na biomasu, malih hidroelektrana
* procjene vjetropotencijala na području od interesa za izgradnju vjetroelektrana
* pre-feasibility i feasibility studije o mogućnostima proizvodnje električne energije, mjerenja i praćenja vjetropotencijala na utvrđenim lokacijama (za vjetroelektrane)
* mogućnosti korištenja lokalnih privrednih subjekata tijekom izgradnje i za vrijeme rada
* prostorno - ekološki uvjeti
* tehnička evaluacija priključka elektrane na električnu mrežu
* ekonomska evaluacija i studija opravdanosti projekta u cjelini

III. Upravni postupak ishođenja lokacijskih dozvola

1. izrada geodetskih podloga:

* ishođenje geodetsko – katastarskih podloga
* ishođenje vlasničkih listova, zemljišno knjižnih izvadaka i sl.
* izrada posebnih geodetskih podloga i idejnih projekata

2. izrada elaborata namjeravanog zahvata u prostoru (za ishođenje lokacijskih dozvola ili usvajanja DPU-a):

* idejni projekt za vjetroelektrane, solarne elektrane i dr.
* idejni projekt za TS
* idejni projekt za kabelski rasplet
* idejni projekt za dalekovod

3. ishođenje posebnih uvjeta te konačno ishođenje lokacijskih dozvola

II. Services in preparation of construction

* *advisory services in the field of selection of optimum locations for the construction of wind power plants, solar power plants, biomass operated plants, small hydro power plants*
* *evaluation of wind potential in the area of interest for the construction of wind power plants*
* *pre-feasibility and feasibility studies of possibilities of production of electricity, measurement and monitoring of wind potential at determined locations (for wind power plants)*
* *a possibility of using local companies during the construction and during the operation*
* *zoning and environmental conditions*
* *technical evaluation of the connection of the power plant to the electrical grid*
* *economic evaluation and project feasibility study in general*

III. Administrative procedure of obtaining site development certificates

1. *preparation of topographic surveys with plane scales:*

* *obtaining geodetic –cadastral documents*
* *obtaining of deeds of title, land registry files etc.*
* *preparation of special geodetic documents and conceptual designs*

2. *preparation of the study of intended works in the area (for obtaining of site development certificates or adoption of detailed urban plan (DUP):*

* *conceptual design for wind power plants, solar power plants etc.*
* *conceptual design for substation*
* *conceptual design for underground cable line*
* *conceptual design for transmission line*

3. *obtaining of special conditions and final obtaining of site development certificates*

IV. Izrada glavnih projekata

1. izrada geotehničkih elaborata (geo – istražni radovi)
2. izrada Glavnih projekata (Prilagodni, Elektromontažni i Arhitektonsko - građevinski):

* glavni projekt za vjetroelektrane, solarne elektrane i dr.
* glavni projekt za TS
* glavni projekt za kabelski rasplet
* glavni projekt za dalekovod

3. nostrifikacija postojećih tipskih projekata

V. Upravni postupak ishođenja građevinskih dozvola

1. rješavanje imovinsko – pravnih odnosa
2. ishođenje suglasnosti na projektnu dokumentaciju
3. ishođenje i pravomoćnost građevinskih dozvola

VI. Izgradnja objekata

1. izvođenje svih građevinskih i elektromontažnih radova na objektima obnovljivih izvora energije
2. izvođenje svih građevinskih i elektromontažnih radova na transformatorskim stanicama svih naponskih razina; VN, SN i NN zračnim i kabelskim vodovima, TK instalacijama i SDV
3. stručni nadzor pri izgradnji objekata
4. ishođenje potrebnih atesta i nostrifikacija postojećih

VII. Proizvodnja

1. proizvodnja čelično - rešetkastih konstrukcija
2. pocinčavanje čelično - rešetkastih konstrukcija
3. proizvodnja ovjesne i spojne opreme

IV. Preparation of main projects

1. *preparation of geotechnical studies (geo-research works)*
2. *preparation of main designs (Compliance, Electrical Installation and Architectural and Construction Designs):*

* *main design for wind power plants, solar power plants etc.*
* *main design for substation*
* *main design for underground cable line*
* *main design for transmission line*

3. *validation of the existing standard designs*

V. Administrative procedure of obtaining building permits

1. *resolving property-legal issues*
2. *obtaining of consent for the project documentation*
3. *obtaining and final building permits with full effect*

VI. Construction of facilities

1. *carrying out all civil engineering and electrical installation works on the facilities for renewable energy sources*
2. *carrying out all civil engineering and electrical installation works on substations of all voltage levels; HV, MV and LV overhead and underground power cable lines, telecommunication installations and SDV*
3. *professional supervision of facility construction*
4. *obtaining of required certificates and validation of the existing ones*

VII. Production

1. *production of steel lattice structures*
2. *galvanization of steel lattice structures*
3. *production of suspension and jointing equipment*

VIII. Upravni postupak ishođenja uporabne dozvole

1. organizacija tehničkog pregleda
2. kompletiranje potrebne dokumentacije te ishođenje Uporabne dozvole

IX. Radovi tijekom pripreme i izgradnje vjetroelektrana

(po potrebi)

* optimalni izbor i smještaj vjetroturbina unutar mikrolokacije vjetrofarme
* mjerenje specifičnog otpora tla i otpora uzemljenja, proračun sustava uzemljenja vjetrofarme
* izrada studije utjecaja elektroenergetskih kablova na telekomunikacijske kablove
* odabir prenaponske i gromobranske zaštite i sl.

X. Praćenje rada objekata obnovljivih izvora energije

* nadzor i upravljanje radom
* održavanje elektrotehničke opreme
* kontrola i poboljšavanje djelotvornosti
* tehničko – tehnološko unapređivanje
* transfer tehnologije trećim poslovnim subjektima

XI. Rješenja tipa "ključ u ruke"

VIII. Administrative procedure of obtaining operating licences

1. *Organization of technical inspection*
2. *Collection of the entire documentation and obtaining of the operating licences*

IX. Works during the preparation and construction of wind power plants

(as required)

* *optimum selection and location of wind power plants within the windfarm microlocation*
* *measurement of specific soil resistance and earthing resistance, calculation of the windfarm earthing system*
* *preparation of the study of impact of energy supply cables on the telecommunication cables*
* *selection of overvoltage and lightning protection etc.*

X. Monitoring of the operation of the renewable energy source facilities

* *supervision and control of operation*
* *maintenance of electric and technical equipment*
* *control and improvement of efficiency*
* *technical and technological advancement*
* *transfer of technology to third legal entities*

XI. "Turn key" solutions

projekti vjetroelektrana

/ wind power plants projects

Do sada je obrađeno oko 25 lokacija u Hrvatskoj i Bosni i Hercegovini.

Mjerni stupovi su postavljeni na 12 lokacija.

Dalekovod d.d. je u studenom 2007. potpisao sporazum sa HEP-om o suradnji na području obnovljivih izvora energije sa naglaskom na projektima vjetroelektrana.

Suradnja se odvija preko HEP-ove tvrtke kćeri HEP OIE (HEP Obnovljivi Izvori Energije) koja u opseg suradnje uključuje i svoje potencijalne lokacije za vjetroelektrane.

Some 25 locations have been processed in Croatia and Bosnia and Herzegovina so far.

Monitoring towers have been erected in 12 locations.

In November 2007, Dalekovod signed an agreement with HEP (Hrvatska Elektroprivreda - "Croatian Electrical Utility") on collaboration in the area of renewable energy sources focusing on the wind power plant projects.

The collaboration is performed through the HEP subsidiary - HEP OIE (HEP "Renewable Energy Resources") that includes all of its potential locations for wind power plants in its scope of collaboration.

Stupovi za mjerenje vjetra (50 i 80 m)

U svrhu preciznijeg mjerenja vjetra kao osnove za kvalitetnu analizu vjetropotencijala, a time i realnu procjenu proizvodnje energije te ekonomskih aspekata projekta, Dalekovod d.d. razvio je vlastite stupove za mjerenje brzine vjetra visine 50 m odnosno 80 m (u pripremi je razvoj stupa visine 100 m).

Karakteristike vjetra mjere se na više visina po želji korisnika stupa. Korisnik sam bira željeni broj konzola i mjerne instrumente.

Za montažu mjernih stupova na odabranim lokacijama Dalekovodu d.d. na raspolaganju je uhodan tim s dugogodišnjim iskustvom u izradi i montaži čeličnih konstrukcija.

Od ukupno 40 stupova Dalekovod d.d. je za svoje potrebe postavio 12 stupova dok je 28 stupova prodano drugim tvrtkama.

Wind monitoring towers (50 and 80 m)

For the purpose of more precise measurement of wind as the basis for producing a quality analysis of the wind potential and consequently for a fair assessment of energy production and economic aspects of the project, Dalekovod d.d. has developed its own anemometer masts which are 50 m and 80 m high (the construction of the tower 100 m heigh is being prepared).

The wind characteristics are measured at several heights as desired by the tower beneficiary. The beneficiary himself selects a desired number of booms and measurement instruments.

For the installment of the monitoring towers at selected locations, Dalekovod d.d. has an experienced team with an extensive experience in production and installment of steel structures.

Out of 40 towers, Dalekovod d.d. has installed 12 towers for its own requirements, while 28 towers has been sold to some other companies.

U okviru tvrtke Dalekovod Eko d.o.o. su i sljedeće tri lokacije Dalekovoda d.d.:

1. VE Otrić (20 MW)
2. VE Mazin 2 (16 MW)
3. VE Voštane (20 MW)

koje su pridružene u dvije razvojne skupine zajedno sa projektima tvrtke EKO d.o.o.

Skupina Gračac nalazi sa na prostoru Zadarske županije i sačinjavaju je:

* VE MAZIN2
* VE OTRIĆ
* VE ZD 6-1

Skupina Voštane nalazi se na prostoru Splitsko – dalmatinske županije i sačinjavaju je:

* VE ST1-2 KAMENSKO
* VE ST1-1 VOŠTANE
* VE VOŠTANE

Konačni cilj nam je izgradnja vjetroelektrana u skladu s pozitivnim propisima Republike Hrvatske uz najveću moguću brigu o zaštiti okoliša.

Within the company Dalekovod Eko d.o.o. there are three locations of Dalekovod d.d.:

1. *WPP Otrić (20 MW)*
2. *WPP Mazin 2 (16 MW)*
3. *WPP Voštane (20 MW)*

that are included into two development groups together with projects of the company EKO d.o.o.

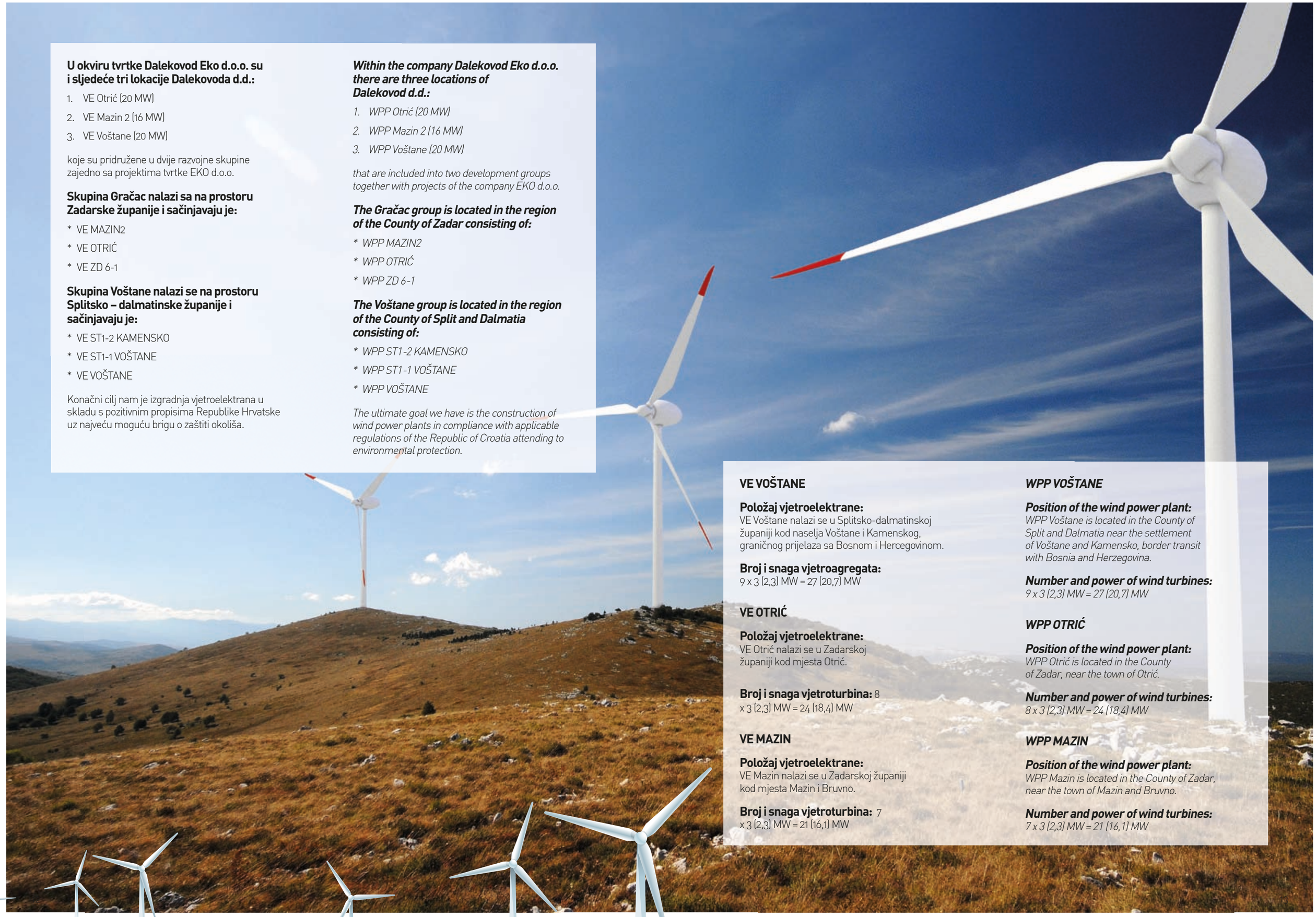
The Gračac group is located in the region of the County of Zadar consisting of:

* *WPP MAZIN2*
* *WPP OTRIĆ*
* *WPP ZD 6-1*

The Voštane group is located in the region of the County of Split and Dalmatia consisting of:

* *WPP ST1-2 KAMENSKO*
* *WPP ST1-1 VOŠTANE*
* *WPP VOŠTANE*

The ultimate goal we have is the construction of wind power plants in compliance with applicable regulations of the Republic of Croatia attending to environmental protection.



VE VOŠTANE

Položaj vjetroelektrane:
VE Voštane nalazi se u Splitsko-dalmatinskoj županiji kod naselja Voštane i Kamenskog, graničnog prijelaza sa Bosnom i Hercegovinom.

Broj i snaga vjetroagregata:
9 x 3 (2,3) MW = 27 (20,7) MW

VE OTRIĆ

Položaj vjetroelektrane:
VE Otrić nalazi se u Zadarskoj županiji kod mjesta Otrić.

Broj i snaga vjetroturbina: 8 x 3 (2,3) MW = 24 (18,4) MW

VE MAZIN

Položaj vjetroelektrane:
VE Mazin nalazi se u Zadarskoj županiji kod mjesta Mazin i Bruvno.

Broj i snaga vjetroturbina: 7 x 3 (2,3) MW = 21 (16,1) MW

WPP VOŠTANE

Position of the wind power plant:
WPP Voštane is located in the County of Split and Dalmatia near the settlement of Voštane and Kamensko, border transit with Bosnia and Herzegovina.

Number and power of wind turbines:
9 x 3 (2,3) MW = 27 (20,7) MW

WPP OTRIĆ

Position of the wind power plant:
WPP Otrić is located in the County of Zadar, near the town of Otrić.

Number and power of wind turbines:
8 x 3 (2,3) MW = 24 (18,4) MW

WPP MAZIN

Position of the wind power plant:
WPP Mazin is located in the County of Zadar, near the town of Mazin and Bruvno.

Number and power of wind turbines:
7 x 3 (2,3) MW = 21 (16,1) MW

projekti u najavi

/ projects announced

solarne elektrane - Solarni park "Žitnjak"

Solarni park Žitnjak biti će prezentacijski projekt kojim bi se pokazale mogućnosti Dalekovoda d.d. u području obnovljivih izvora energije (solarne energije).

U samoj instalaciji su uključena tri proizvoda:

1. solarna elektrana na metalnim konstrukcijama snage oko 1,2 kW
2. solarni stup za rasvjetu (rasvjetni stup bez niskonaponske instalacije)
3. čuvar parkinga na solarni pogon (čuvar parkirnog mjesta s rampom na solarni pogon)

Dalekovod d.d. je u mogućnosti ponuditi:

* izradu čeličnih nosača za fotonaponske module
* stručni nadzor prilikom izgradnje
* nostrifikaciju postojećih projekata
* izvođenje svih građevinskih i elektromontažnih radova
* ishođenje svih potrebnih dozvola
* mogućnost pokretanja vlastite proizvodnje fotonaponskih modula

Od strane tvrtke Dalekovod d.d. u pripremnoj fazi su projekti solarnih fotonaponskih elektrana snage do 1 MW.

solar power plants -Solar park "Žitnjak"

The solar park Žitnjak will be the presentation-like project that shows what Dalekovod d.d. can do in the area of renewable energy sources (solar energy).

The installation itself includes three products:

1. solar power plant on metal structures with power of around 1.2 kW

2. solar lighting tower (lighting tower with no low voltage installation)

3. parking lot guard operated by solar energy (parking lot guard with a ramp operated by solar energy)

Dalekovod d.d. can offer:

* *production of steel carriers for photovoltaic modules*
* *professional supervision during construction*
* *validation of the existing projects*
* *execution of all civil engineering and electrical installation works*
* *obtaining of all required permits*
* *a possibility of initiation of own production of photovoltaic modules*

Dalekovod d.d. is preparing projects relating to solar photovoltaic electric power plants up to 1 MW.

male hidroelektrane

Dalekovod d.d. je u mogućnosti ponuditi usluge "ključ u ruke" za male hidroelektrane do 10 MW.

small hydro power plants

Dalekovod d.d. may offer "turn key" solutions for small hydro power plants up to 10 MW.

projekti korištenja biomase:

* toplane na biomasu
* kogeneracijska postrojenja

BIOMASA je definirana kao "biorazgradivi dijelovi proizvoda, otpada ili ostataka iz poljoprivrede, šumski otpad i otpad srodnih industrija kao i biorazgradivi dijelovi industrijskog i gradskog otpada".

Dalekovod d.d. i biomasa

Razvojni tim unutar Dalekovoda d.d., aktivno razvija nove projekte koji uključuju biomasu i njenu implementaciju, što se prije svega odnosi na toplane za biomasu i kogeneracijska postrojenja.

U pripremnoj fazi su projekti toplana te kogeneracijskih postrojenja na biomasu.

projects relating to using biomass:

** biomass thermal power plants*

** cogeneration plants*

BIOMASS is defined as "biodegradable parts of products, waste or residues from agriculture, forest waste and related industrial waste and biodegradable parts of industrial and municipal waste" .

Dalekovod d.d. and biomass

The development team within Dalekovod d.d. is actively developing new projects including biomass and its implementation, which primarily refers to thermal power plant for biomass and cogeneration plants.

The designs for thermal power plant and cogeneration plant operated by biomass are being prepared.

obrada otpada metodom Ecocycling

Ecocycling metoda predstavlja mogućnost prerade komunalnog otpada u sekundarnu sirovinu te ponovnog uvođenja u privredni kružni tok. Također postoji mogućnost da se osim otpada postupkom Ecocycling obradi i mulj (npr. iz kanalizacija, blato iz luka, industrijski mulj).

Potrebno je istaknuti da se pomoću postupka Ecocycling mogu obraditi sve vrste otpada, osobito komunalni kućni otpad, komunalni mulj iz uređaja za pročišćavanje otpadnih voda te razne vrste industrijskog otpada (osim eksplozivnih materijala, metala, radioaktivnog otpada i autoguma).

Karakteristike tehnološkog procesa:

* nije potreban nikakav termički tretman
* nema emisija u atmosferu
* proces je suh te nema utjecaja na podzemne vode niti na bilo kakvo zagađenje okoliša
* potrebna je relativno mala količina električne energije
* nema potrebe za sanitarnim deponijem
* investicijski je daleko ispod troškova za proces mehaničko-biološke obrade (MBO)

Metodu je razvila tvrtka X products.

waste treatment by using the Ecocycling method

Ecocycling method represents a possibility of processing of municipal waste into secondary raw material and its reintroduction into economic circular flow. There is also a possibility of treating waste sludge (such as the waste sludge from sewers, waste sludge from ports, industrial waste sludge) by using the Ecocycling process.

It is necessary to point out that all types of waste, especially municipal house waste, municipal waste sludge from the devices for purification of waste waters and different types of industrial waste (except for explosive material, metals, radioactive waste and car tires) may be treated by applying the Ecocycling process.

The characteristics of the technological process:

** No thermal treatment is required*

** There is no emission into the atmosphere*

** The process is dry and there is no impact on underground waters or any environmental pollution*

** A relatively small quantity of electricity is required*

** There is no need for sanitary waste disposal*

** In terms of investments, it is far below the costs for the process of mechanical and biological treatment (MBT)*

The method has been developed by the company X products.

proizvodi u razvoju

/ products in development

a) solarni stup

Deset posto sveukupne električne energije troši se na uličnu rasvjetu. Solarni stup ima nekoliko prednosti, a to su prije svega:

* očuvanje okoliša
* nema kopanja, polaganja kabela ili montiranja elektrifikacijskih prijenosnih stupova
* jednostavna realizacija projekta zahtjeva minimalne potrebe za ljudskim resursima
* jednostavna prenosivost stupova
* nema potrebe za instalacijom transformatorskih stanica
* nema dodatnih troškova (npr. račun za struju)

b) čuvar parkinga na solarni pogon

Uređaj naziva "čuvar parkinga na solarni pogon" za funkcioniranje koristi sunčevu energiju. Za razliku od vrata i mehaničkih mehanizama s lokotima ili bravicama za čije korištenje treba izaći iz auta, „čuvar parkinga" koristi daljinski upravljač i to na udaljenosti do 20 m.

a) solar tower

Ten per cent of total electricity is consumed on street lighting. The solar tower has several advantages, these are the following:

* *environmental protection*
* *no digging, laying cables or mounting electrification overhead lines*
* *a simple implementation of the project requires minimum requirements for human resources*
* *a simple mobility of towers*
* *no need for installation of substations*
* *no additional costs (electricity bills)*

b) parking lot guard operated by solar energy

The device called "parking lot guard operated by solar energy" uses solar energy for its operation. Unlike the door and mechanical mechanisms with locks or latches when you need to get out of the car to use it, the parking lot guard uses remote control at a distance of 20 m.