



RENEW
Renewable Energy Sources



exxer Skills for
the Future

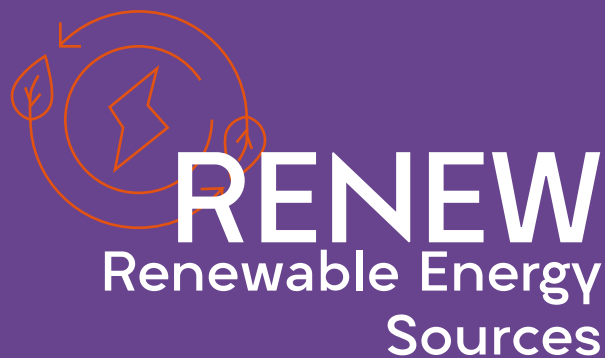
THE UNION OF EXPERTISE AND SKILLS A NEW LEVEL OF EXCELLENCE IN EDUCATION!

EXXER was born from the merger of two companies passionate about **technology, innovation, and education.**

With the purpose of offering more and more excellence tools to assist in technological education, we believe the union of practical and theoretical learning is what makes the difference in accelerating human and world **development!**




TECHNOLOGY ● **INNOVATION** ● **EDUCATION**

The graphic features the word "RENEW" in large, bold, white capital letters. Below it, the words "Renewable Energy Sources" are written in a smaller, white, sans-serif font. To the left of the text, there is a circular orange icon containing a lightning bolt, a leaf, and a water drop, with arrows indicating a clockwise cycle.

RENEW

Renewable Energy Sources

 Renewable energy sources are one of the most relevant topics in tackling climate challenges. The growth in the use of these new forms of electricity generation has demanded more and more professionals, whether in industrial, commercial or even residential applications. Training a workforce with practical skills for these issues is an urgent demand, from small generation centers to large plants. To help with this challenge, the RENEW series brings a complete line of practical tasks with renewable energy generation systems, involving the themes:


- Solar Power Generation;
- Wind Power Generation;
- Hydroelectricity Generation;

Modular system based on Technik+ workbenches, allowing different configurations with the most modern and used devices on the market


Also, because it is a modular system, it allows the inclusion of new modules to address new topics, thus optimizing investment and space, and enabling a future-proof solution.

It has exclusive modules that allows exploring advanced features: solar panel simulator, which simulates the behavior of a solar panel in different lighting conditions and throughout the day, and data acquisition system that allows monitoring simultaneous measurements of various parts of the system.

Software and applications complement the learning solution, ensuring greater effectiveness through more dynamic and modern learning.

 All kits in this series have a comprehensive courseware, focused on teaching by skills and easy to use by instructors.

We have complete solutions for training and updating teachers, ensuring the best use of the kit's resources.

 **Ask our experts for more information and the detailed technical features of each equipment in the series.**



MAIN SKILLS AND COMPETENCIES

- Understand the energy scenario in Brazil
- Understand the importance of renewable energy sources
- Know the difference between on-grid system and off-grid system
- Understand how the on-grid solar energy system works
- Understand smart grid technology
- Install the solar power generation system
- Understand, in a practical way, the operation of the microinverter
- Search for components and their prices for projects
- Prepare budgets
- Install the wind power generation system
- Understand the operation of a hybrid system
- Conduct experiments and tests with the wind-solar system
- List the basic components of an off-grid system
- Understand the importance of the battery in an off-grid system
- Install the off-grid solar power generation system
- Conduct experiments and tests with the off-grid wind-solar system



TECHNOLOGY HIGHLIGHTS

The RENEW series kits are modular, allowing to work with on-grid and off-grid, solar, wind, hydro and hybrid systems.


A relevant topic for agribusiness and rural communities that can be addressed with this kit is solar-powered water pumping.

The power generation systems used are professional equipment and include:

- Photovoltaic Generation: 2 100W panels
- Wind Power Generation : wind micro-generator
- Hydroelectricity Generation: Pelton turbine

The wind turbine kit emphasizes the mechanical components and supervision systems of large wind turbines, which is reproduced in miniature with all its systems. It is the perfect kit for training in wind turbine maintenance.



 Thinking about the usability and learning process of each student, we developed learning solutions to provide benefits and differentials for users.

KEY BENEFITS

- Modular;
- Industrial devices;
- Easy storage.

KEY DIFFERENTIALS

- Safety;
- Ergonomics certificate;
- No tools required;
- Augmented Reality;
- Courseware

 MAIN DEVICES

PRODUCT	DESCRIPTION	POWER	OPTIONS
RENEW2000	Renewable Energy Workbench	Three-phase 110/220Vac	–
RENEW3000	Wind TURbine Teste Bench	Three-phase 220/380V	–
RENEW4000	Photovoltaic Solar Energy Dock Station	Single-phase 110/220Vac	–

PRODUCT	DESCRIPTION		
	RENEW2000-L3-001	RENEW2000-L3-002	RENEW2000-L3-003
	Complete	Solar	Wind
Off-grid solar power generations	✓	✓	✗
On-grid solar power generations	✓	✓	✗
Off-grid Wind power generations	✓	✗	✓
On-grid Wind power generations	✓	✗	✓
Hydroelectricity Generation (Pelton Turbine)	✓	✗	✗

FEATURES

With modular configuration, Safety with NR-12, development software included, protection of main components and courseware included.

RENEW2000

Renewable Energy Workbench



Settings

- Dock station: compact, can be attached to benches and racks;
- Natural anodized aluminum rear closure;
- Plastic side closure;
- TS-type front plate with indelible identification.

DIMENSIONS (HxWxD)

Workstation	2000 x 1410 x 840 mm;
Solar Power lab	600 x 380 x 440 mm;
Solar Power Field	1300 x 660 x 790 mm;
Wind Power Lab	1210 x 800 x 670 mm;
Wind Power Field	1800 x 1200 x 1300 mm;
Photovoltaic Pumping	1400 x 900 x 400 mm;
Weight	230 Kg (sem água).

CARACTERÍSTICAS ELÉTRICAS

Power	bivolt 110/220Vav – 50/60Hz
Connections	4mm Safety Terminals

FEATURES

With modular configuration, Safety according to NR-12, development software, protection of main components and courseware included.

RENEW3000

Wind Turbine Test Bench



Settings

- Dock station: compact, can be attached to benches and racks;
- Natural anodized aluminum rear closure;
- Plastic side closure;
- TS-type front plate with indelible identification.

DIMENSIONS (HxWxD)

Height	2031mm
Width	1600mm
Depth	1660mm
Weight	700Kg

CARACTERÍSTICAS ELÉTRICAS

Power	Three-Phase 220v 50/60Hz
Connections	4mm Safety terminals

FEATURES

With modular configuration, Safety according to NR-12, development software, protection of main components and courseware included.

RENEW4000

Photovoltaic Solar Energy Dock Station



Settings

- Dock station: compact, can be attached to benches and racks;
- Natural anodized aluminum rear closure;
- Plastic side closure;
- TS-type front plate with indelible identification.

DIMENSIONS (HxWxD)

Dock Station	150x450x340mm
Photovoltaic Cells	270x220x150mm
Weight	10Kg

ELECTRICAL FEATURES

Power	Single-Phase 127Vca / 220Vac
Connections	4mm safety terminal


Laboratório de Instalações Industriais



USE

Guidelines on the recommended use of the Kit!

In “teams” define the optimal and maximum number of students per kit.

 Use can be “intense”, therefore, 1 kit per work team; or “occasional/shared”, that is, it is not used all the time and therefore there may be less kits than teams, which the optimal and maximum numbers must be indicated.

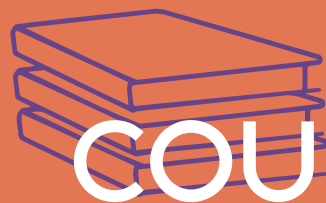
PART NUMBER	DESCRIPTION	TEAMS(STUDENTS KIT)	USE
RENEW2000	Renewable Energy Workbench	3 – 4	1 Kit per team
RENEW3000	Wind Turbine test Bench	3 – 4	1 Kit or 3 teams
RENEW4000	Photovoltaic Solar Energy Dock Station	2 – 3	1 Kit per team

INFRASTRUCTURE

	RENEW2000	RENEW3000	RENEW4000
Electric	1 three-phase socket	1 three-phase socket	1 Single-phase socket

CONNECTIVITY

Ethernet connections per workstation	–
Wifi Network	Necessary for the kits
Access to the Internet	Recommended
Computer	Recommended; Accordind to minimum requirements of software



COURSEWARE

The training kits have a wide courseware with a practical focus, containing practical proposals aimed at training skills and competencies.

In addition to the **User Manual**, which contains information on operation and maintenance, the **Student Guide** is also provided, with proposals for practical activities to be carried out using the kit, and the **Facilitator Guide**, with answers to the proposed activities and guidelines to use the kit in a didactic way. In addition, **Video Tutorials** are available to help you easily master the development tools and use the kit.

All of this content is available on our website at the **Facilitator Portal**.



SKILLS AND COMPETENCIES

Kit devices

- Understand the energy scenario in Brazil
- Understand the importance of renewable energy sources
- Know the difference between the types of possible connections
- Understand the courseware methodology

On-grid technology

- Know the difference between on-grid system and off-grid system
- Understand how the on-grid solar energy system works
- Understand smart grid technology
- Analyze solar panel data sheets
- Recognize a solar power generation system
- Classify the basic items of a solar power generation system
- Install the solar power generation system
- Analyze the results obtained in the energy generation process
- Check the on-grid system concept
- Understand, in a practical way, the operation of the microinverter
- Search for components and their prices for projects
- Prepare budgets
- Design a solar power generation system
- Understand the energy efficiency of a solar panel
- Understand the different types of associations with photovoltaic modules
- Classify the basic items for wind power generation
- Install the wind power generation system
- Analyze the results obtained in the energy generation process

On-grid technology

- Check the on-grid system concept
- Understand the operation of a hybrid system
- Conduct experiments and tests with the wind-solar system

On-grid technology

- Describe the off-grid system operation
- Know the difference between on-grid system and off-grid system
- List the basic components of an off-grid system
- Understand the importance of the battery in an off-grid system
- Classify the basic items for off-grid wind power generation
- Analyze the results obtained in the energy generation process
- Check the off-grid system concept in practice
- Recognize an off-grid solar power generation system
- Classify the basic items for off-grid solar power generation
- Install the off-grid solar power generation system
- Analyze the results obtained in the power generation process
- Understand the operation of an off-grid hybrid system
- Identify the types of hybrid systems
- Conduct experiments and tests with the off-grid wind-solar system

MOBILE APPLICATION

A current teaching solution is not complete without software and applications. Along with the kits of this series, exclusive licenses are provided for applications on computer and mobile devices that complement and enhance the use of the kits.

Exxer App

AUGMENTED REALITY KITS

The solutions can be visualized in 3D through augmented reality, allowing the student to have a first contact and identify their main characteristics.



Exxer App

EDUCATIONAL ANIMATION

- Augmented reality animations that show the main devices in section, and their assembly/disassembly process.
- Display of operating principles.
- Animations that help to understand the physical processes involved and the application of technology.



Exxer App

DATA ACQUISITION AND CONTROL

Communication between the Exxer App and the kit's data acquisition and control boards allows for measurements and interaction across the apps.



DESKTOP APPLICATIONS

A current learning solution is not complete without software and applications. Along with the kits of this series, exclusive licenses are provided for applications on computer and mobile devices that complement and enhance the use of the kits.

Data Acquisition and Control

- Communication with the kit's data acquisition and control boards allows measurements and interaction through the software installed on the PC.





TRAINING

As important as teaching resources and tools is teacher training. We have a complete package of solutions for your training and upgrading needs.

Quick Start and Tutorials

Quick start is a quick video guide to learn, test and put the product into operation. Tutorials are videos that teach common procedures needed in classes using the kit.

Technical Delivery

In the technical delivery, our experts present the product, its features, as well as maintenance and safety precautions, and put it into operation together with the customers.

Operational Training

The purpose of operational training is to teach facilitators on how to use the kit. The kit courseware is presented and some proposed practices are carried out. It also includes all technical delivery activities.

Technological Trainin

Technological training is a deeper learning of technology and applied concepts. These courses are not focused on kits but on topics and technical skills to update trainers.



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