

Ansell



RENEWABLES ON THE RISE

PROVIDING SUITABLE PPE SOLUTIONS FOR THE GROWING RENEWABLE ENERGY INDUSTRY

INTRODUCTION

Demand for renewable energy sources is increasing globally, as many countries transition away from energy production that utilises limited resources, in search of a more sustainable system. This escalation is driving employment creation across a diverse range of industrial occupations including trades, technicians and other hands-on professionals, most of whom face a range of workplace hazards on a daily basis and require suitable personal protective equipment (PPE) to minimise risk of harm.

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OPPORTUNITY IN RENEWABLE ENERGY

The advantages of renewable energy sources are clear when compared with traditional generation. Whereas oil, coal and gas resources are finite, supply of renewable sources can be repeatedly replenished, regardless of consumption levels. Cleaner power generation and lower carbon emissions are key benefits of a transition away from fossil fuels.

According to the International Energy Agency (IEA), renewable energy production is increasing globally. This growth is attributed to international policy changes, the issuing of long-term contracts, priority access to the grid and continuous installation of new plants.¹ The share of renewables in global electricity generation rose to 29% in 2020, up from 27% in 2019, a trajectory that is predicted to continue at levels of year-on-year growth not seen since the 1970s.²



¹ International Energy Association (IEA) – Global Energy Review 2021 – Renewables. <https://www.iea.org/reports/global-energy-review-2021/renewables>

² IEA

DIFFERENT TYPES OF RENEWABLE ENERGY

The ongoing availability of natural resources is one of the key benefits of renewable energy; where sunlight, wind, water, and organic matter can all be used for power generation and are virtually limitless in supply.



Solar

Solar power is generated when sunlight is converted into electricity or used to heat air, water, or other fluids. Solar energy technology is one of two types: solar photovoltaic (PV) or solar thermal.

Solar PV converts sunlight directly into electricity using PV cells. PV cells are integrated into panels which are installed in domestic and small-scale commercial applications, through to large-scale power plants. The IEA predicts annual global growth in solar PV electricity generation of around 18%.³

Solar thermal converts solar radiation into thermal energy (heat), which is then carried by air, water or other fluid to heat space directly or to generate electricity using steam and turbines. It is commonly used for hot water systems and large-scale power generation.



Wind

Wind power is one of the fastest growing renewables sectors. Current production is largely concentrated in Europe and the United States, while China and India are predicated to experience rapid growth in the short term.⁴ Wind power energy is generated by converting wind currents using a wind power generator, or turbine, which extracts energy from passing air. Wind energy is typically used for electricity generation that is used onsite or transported to the grid.



Hydroelectricity

Hydroelectric power is an advanced and mature renewable technology that is currently used in over 160 countries globally. It uses water flow to rotate turbine blades and drive an electrical generator that converts motion into electrical energy. Its low operational costs and quick demand response make hydroelectricity useful for both base and peak load generation.



Bioenergy

Bioenergy is the use of biomass (organic material derived from vegetables or animals) as a source of electricity generation. This type of energy is used in domestic, commercial, and industrial applications, as well as the production of liquid fuels (biofuels) for transport. About ten percent of the world's primary energy consumption comes from bioenergy, with the main growth markets identified as the European Union, North America, Central and Eastern Europe and Southeast Asia.⁵

³ IEA

⁴ Geoscience Australia – Australian Government. Energy Resources: Wind Energy <https://www.ga.gov.au/scientific-topics/energy/resources/other-renewable-energy-resources/wind-energy>

⁵ Geoscience Australia - Australian Government. Energy Resources: Bioenergy <https://www.ga.gov.au/scientific-topics/energy/resources/other-renewable-energy-resources/bioenergy>

RENEWABLES INDUSTRY HAZARDS AND HAND PROTECTION SOLUTIONS

As the renewables sector grows, so does the requirement for workers. A 2020 report on the Australian renewables industry found that one in five workers are electricians or electrical trade assistants. Other major occupations included roofers and installers (of solar PV systems) and members of metal, construction, and mechanical trades.⁶

Renewable energy industry workers are exposed to a range of workplace hazards in line with occupational norms, along with additional risks specific to the sector – for example, wind technicians carry out a range of mechanical, hydraulic, and electrical maintenance tasks on turbines at heights of up to 75 metres, while solar PV panel installers also work at height and are additionally at risk of electrical shock injury from loose wiring or corroded cables. Both are susceptible to external elements as a routine part of the job.

It's important for safety and operations managers to correctly identify specific hazards and provide PPE that is fit for purpose to ensure optimum worker safety. In terms of risk that requires hand protection as a defence, these hazards can generally be grouped into the following categories.

Renewables Industry Hazards



Electrical shocks and burns



Arc flashes



Harsh weather conditions or extreme temperatures



⁶ Briggs, C., Rutovitz, J., Dominish, E., Nagrath, K. 2020. Renewable Energy Jobs in Australia – Stage 1. Prepared for the Clean Energy Council by the Institute for Sustainable Futures, University of Technology Sydney

ELECTRICAL SHOCKS AND BURNS

Wind turbine technicians, solar PV panel installers, utility service technicians and substation technicians are all exposed to electrical shock risk each day. Rubber insulating gloves and outer protectors are essential PPE components for electrical work.

To ensure adequate protection against electrical shocks in combination with the need for mechanical protection – including cut, puncture, and abrasion resistance – outer leather protector gloves should be worn over rubber insulating gloves, with the added benefit of extending the rubber glove wear life.

Low voltage Class 00 rubber gloves offer suitable hand protection against electrical discharge up to 500V AC / 750V DC, while Class 0 remain effective against voltage up to 1,000V AC / 1,500V DC. In high voltage applications, Class 1, 2, 3, and 4 rubber insulating gloves ensure suitable hand protection against electrical discharge ranging from 7,500V AC/ 11,250 DC to 36,000V AC / 54,000V DC.

Electrical safety glove solutions are available with varying specifications in terms of special features, comfort levels, dimensions and ergonomics, which means that safety managers can find gloves to match application requirements.

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ARC FLASHES

Protection from arc flash is required when working on wind turbine switchgear or electrical equipment panels and when carrying out tasks in a solar substation or hydroelectric plant, among other applications.

Defence from arc flash requires a hand protection solution that offers heat-resistance and certified compliance to relevant Arc Flash Standards. An ergonomic design that provides adequate flexibility and dexterity will help workers carry out tasks comfortably will help reduce slippage and tension, securing performance in wet, oily and dry conditions.



HARSH WEATHER CONDITIONS OR EXTREME TEMPERATURES

Many tasks in the renewables industry are performed in outdoor locations or confined spaces like substations, meaning workers are often exposed to extreme temperatures. Insulated gloves designed to provide protection against temperature extremes will ensure safe and comfortable handling of tools and components.

Insulation should be optimised to guard against low ambient temperatures, while enabling handling of hot components. They should be constructed from a high visibility material to ensure they can be seen in poor lighting conditions and be designed with advanced ergonomics to ensure a superior fit, comfort, and flexibility.



RISK IS UNAVOIDABLE, BUT MITIGATION IS ESSENTIAL

Many occupations in the renewables sector present a range of unavoidable risks, so the provision of suitable PPE is an essential part of an organisation's safety system. For safety and operations managers serious about mitigating risk, selecting hand protection solutions that have been developed using specialist engineering will not only deliver the optimal safeguard against avoidable accidents and injury, but ensure that a fast-growing industry sector remains committed to the safety and wellbeing of its members.



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