Global Response GR-4

Electromagnetic Field Impacts

A number of commenters stated that the JVR Energy Park Project (Proposed Project) would create electromagnetic fields, which generate electronic pollution and stray currents. Several comments state that there is a causal relationship between electromagnetic field (EMF) exposure and adverse health effects. This Global Response discusses electromagnetic fields and existing studies regarding potential adverse health effects from exposure to EMFs, and the issue of stray currents.

Electromagnetic Fields

Electromagnetic fields are invisible lines of force that are present wherever electricity flows, such as along power lines, around electrical facilities, and from various electrical appliances typically found in households. EMFs attenuate rapidly with distance from the source. (San Diego Gas & Electric (SDG&E) Understanding electric and magnetic fields (2015) https://www.sdge.com/sites/default/files/final_emf_s1510006_eng.pdf (accessed on Jan. 1, 2021) ("SDG&E, 2015").) These fields are low-energy, extremely low frequency fields. Exposure to EMFs comes from common sources such as distribution and transmission lines, wiring in walls, ground currents in water pipes, and from electrical appliances such as microwaves, clothes washers, fluorescent lamps, computers, televisions, and hair dryers. (SDG&E, 2015.) The following Project components would create varying amounts of EMFs: photovoltaic (PV) panels, inverter/transformers, battery energy storage units, the electrical underground collection and transmission system, and the substation, switchyard, and overhead transmission line tie-in to the existing 138kV transmission line.

The California Public Utilities Commission (CPUC) has implemented a number of EMF measurements, research, and education programs, and has provided direction that led to the preparation of the California Department of Health Services' review of existing studies related to EMFs from power lines and associated potential health risks. (CPUC, PUC Actions Regarding EMFs, https://www.cpuc.ca.gov/General.aspx?id=3810 (accessed on Jan. 6, 2020) ("CPUC, EMF").) The CPUC stated, "at this time we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences." (CPUC, EMF.) The CPUC has not established any connection between EMF exposure and negative effects to human health. As the public agency charged with serving the public interest by ensuring the provision of safe and reliable utility services, such a position is reasonable given the current science and available data.

Additionally, the County of San Diego's 2019 Public Health Position Statement, Human Health Effects of Wind Turbines ("2019 Public Health Position Statement"), summarized literature reviews on EMFs. The 2019 Public Health Position Statement concluded that available literature provides no clear evidence that the operation of wind turbines and associated infrastructure directly contributes to health concerns as a result of EMFs. (County of San Diego, *Public Health Position Statement, Human Health Effects of Wind Turbines* (February 25, 2019) available at https://www.sandiegocounty.gov/content/dam/sdc/pds/advance/2019%20Public%20Health%20Position%20Statement%20on%20Human%20Health%20Effects%20of%20Wind%20Turbines.pdf (last visited January 7, 2021.) Although the County acknowledges that the focus of the 2019 Public Health Position Statement is wind turbines and associated infrastructure, the underlying research into EMF is pertinent to the issue of whether EMF is a health issue generally.

Also, a memorandum was prepared for a large scale solar project that the County approved several years ago—the Soitec solar energy facilities project to evaluate EMFs and human health effects, which is included as an Appendix to the Soitec Solar Farm Development Final EIR certified by the County of San Diego. (See Asher Sheppard Consulting, *Health Issues Related to the Static and Power-Frequency Electric and Magnetic Fields (EMFs) of the Soitec Solar Energy Farms - Memorandum on Scientific Information Related to Human Health Effect* (April 30, 2014) available at https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/Appendix_9.0-1_EMF.pdf.) The Soitec development included four solar farms. The EMF memorandum focused on the Tierra del Sol and Rugged solar farms because project-level detail was available for those projects; however, it was equally applicable to the LanEast and LanWest solar farms assuming they are constructed using technology and layout comparable to those of the Tierra del Sol and Rugged solar farms. This memorandum reaches three conclusions:

- There is no agreement among scientists that time-varying EMFs comparable to those of the project pose a potential health risk, and there are no defined or adopted CEQA/NEPA impacts concerning a health risk from EMF exposures;

- EMFs from the CPV trackers would not be significant outside each project's boundary;

- The static electric and magnetic fields of the Proposed Project are highly localized, very much weaker than limits found in all safety guidelines, and imperceptible at all locations accessible to the public. They pose no known concern for human health.

The Soitec EMF memorandum further clarified: "[p]otential health effects from exposure to electric fields from power lines, substation buswork, switchgear and transformers are typically not a focus of concern because these fields are attenuated by common environmental features such as trees with foliage and the building materials used for homes, offices and manufacturing sites."

The Soitec EMF memorandum is relevant to the Proposed Project for two reasons. First, both the Soitec solar projects and the Proposed Project utilize photovoltaic panels, inverter/transformers, an electrical underground collection and transmission system, and a substation, switchyard, and overhead transmission line tie-in to an existing 138kV transmission line. Second, both the Soitec projects and the Proposed Project include a perimeter fire access road that separates the project components from the fenceline. (Compare Final Revised Soitec Solar Development Program Environmental Impact Report, Chapter 1 [Soitec projects include perimeter fire access roads "constructed to a minimum width of 24 feet graded"], with the JVR Energy Park Draft EIR, Chapter 1 ["perimeter internal access within the fenced solar facility would be constructed to a minimum improved width of 24 feet"].) The Proposed Project differs from the Soitec projects in that a battery energy storage system is also proposed; however, the battery storage containers would be located at 25 locations within the development footprint and would not be immediately adjacent to property lines. The conclusions from the Soitec memorandum, as listed above, are also applicable to the Proposed Project based on the similar technology used and the perimeter fire road implemented as part of the Soitec projects and Proposed Project design. Given the similarity between the Soitec project and the Proposed Project and the fact that there is no evidence showing the Soitec EMF memorandum's findings would not apply to the Proposed Project, a study specific to the Proposed Project has not been prepared.

Stray Currents

Some commenters expressed concern that the Proposed Project would discharge electricity to ground and produce a phenomenon known as stray current. The Proposed Project is not expected to off load any electricity into the ground. The Proposed Project will produce renewable energy that will be transmitted to the existing SDG&E 138 kV transmission line. If there is insufficient economic demand for the Proposed Project's energy in any given circumstance, the Proposed Project will direct its production into the battery energy storage system or curtail its energy production.

In the context of CEQA for determination of environmental impacts, there are no defined or adopted CEQA standards for defining health risks from these concerns, and no general agreement has been reached among scientists that stray current contributes to health risks. Further, EMFs attenuate rapidly with distance from the source. (SDG&E, 2015.) Given the distance to sensitive receptors and the Proposed Project setbacks, the Proposed Project is not anticipated to result in measurable levels of EMF at nearby residences that would result in adverse effects to public health or safety. There is inadequate or no evidence of health effects at low exposure levels. (SDG&E, 2015; World Health Organization, Extremely Low Frequency Field Environmental Health Criteria Monograph No. 238 (2007) https://www.who.int/peh emf/publications/Complet_DEC_2007.pdf ?ua=1 (accessed on Jan. 6, 2020).)

The commenters cite to articles and websites about stray currents and reducing EMF from solar panels to avoid damage to other electronic equipment, which, do not provide persuasive evidence of the health hazards associated with exposure to stray currents or EMF from the Proposed Project. The County acknowledges there is other miscellaneous data available on the Internet; however, only scientific data from credible sources can be relied on to reach conclusions in the EIR. Available credible science and literature on the topic of health effects from renewable energy have been reviewed in preparation of this EIR, including concepts related to EMF and photovoltaic panels, and there are no epidemiological evidence-based studies to support pathological effects from solar energy projects. It is up to the lead agency to evaluate the presented material and data and make its own determinations regarding the material's competence and accuracy. It is the responsibility of the lead agency to weigh the evidence, and it may accept one expert opinion over another, so long as the decision is supported by substantial evidence. (Pub. Res. Code § 21080(e); 14 CCR §§ 15064(f)(5) & 15384.) The commenters' references do not provide persuasive evidence of the health hazards associated with exposure to EMF from the Proposed Project.