(Nyman, 2018). **However, grid-level energy security considerations include various equity and distributional questions, including:**

- Considering which populations face disproportionate harms in the face of outages, and who would therefore benefit most from investments to ensure security of energy supply and/or the electric grid. For example, medically vulnerable, disabled, and elderly people are more reliant on consistent electricity access for their health, comfort, and safety (Molinari, Chen, Krishna, & Morris, 2017).
- Considering whether steps taken to improve energy security ensure benefits for all populations, including the most vulnerable.
- Considering whether steps taken to improve energy security, such as any increase in domestic fossil fuel production, may have adverse and disproportionate impacts on vulnerable populations.

Climate and environmental impacts as energy security

A growing body of literature on energy security includes reducing climate and environmental impacts as a core security dimension. The impacts of climate change contribute to extreme weather events and geopolitical destabilization, and these impacts are exacerbated by fossil fuel production and use. Immediate air and water pollution impacts from fossil fuel production and use can also negatively impact the welfare, stability, and therefore overall security of a population, with disproportionate harms borne by already vulnerable populations (Simpson, 2013; Luke & Heynen, 2020). Therefore, reducing climate impacts by, for example, transitioning away from fossil fuels and toward non-emitting sources of energy can contribute to energy security (Sovacool & Mukherjee, 2011; Mara, Nate, Stavytskyy, & Kharlamova, 2022). A joint consideration of equity, climate, and pollution as elements of energy security may include:

- Evaluating which communities are disproportionately harmed by extreme weather and other climate impacts. These communities tend to be socioeconomically marginalized, including low-income communities and people of color (Luke & Heynen, 2020; Chakraborty, Collins, & Grineski, 2019).
- Evaluating the distribution of harmful public health impacts of pollution from fossil fuel energy production, which also disproportionately falls on marginalized communities, especially low-income communities and people of color (Simpson, 2013; Luke & Heynen, 2020).

Resilience

Energy security is a relatively more well-established concept with working knowledge across the electric power industry, as outlined above. Resilience, however, is a newer and evolving concept in the electric power sector. Just as with energy security, it is important to differentiate *grid resilience* from *community resilience* or *household resilience*, with the latter two being more closely linked to question of equity than the first. In some cases, resilience can also refer to *ecosystem* or *ecological resilience*, a definition that encompasses much broader, non-energy concepts, and refers to the management of ecosystems in order to ensure that adequate resources can sustain biodiversity and human needs over the long term, even in the face of extreme events (Baker, DeVar, & Prakash, 2019; Climate Justice Alliance, 2018).