

Find Your Energy Balance in Your STEM Career!

BY DR. CHRISTINE S. GRANT

WHEN I THINK OF ENERGY, I think of two extremes: my personal, intrinsic energy that motivates me every day, and the energy it takes to move myself from place to place. According to the Oxford dictionary, energy is formally defined in three main ways: the strength and vitality required for sustained physical or mental activity, the ability to be active; natural enthusiasm and effort; and power derived from the utilization of physical or chemical resources (i.e., usable power that comes from heat, electricity, etc.), especially to provide light and heat or to work machines.

Two of the grand challenges for engineering articulated by the National Academy of Engineering (engineeringchallenges.org) are focused on energy: making solar energy economical and providing energy from fusion. According to the website, the latter challenge indicates that the "challenges facing the engineering community are to find ways to scale up the fusion process to commercial proportions, in an efficient, economical and environmentally benign way." STEM professionals working in these areas are increasingly tasked with out-of-the-box thinking on ways to consider the costs, reliability and accessibility of energy on a global scale. The increasing importance of this effort has not been lost on the proposed national research and development budget. According to the American Association for the Advancement of Science's Guide to the President's Budget (2017), the administration proposes an almost 20 percent increase in the funding for applied energy research and development.

How we define energy has changed

over time. I remember when I received my bachelor's degree in chemical engineering in 1984, it was a low point in the hiring cycle for chemical engineers in what we then called oil or petroleum companies. Fast forward to the early 2000s, one of my chemical engineering graduate student advisees received his Master of Science under my direction and went to work for one of these "oil" companies, now referred to more broadly as "energy" companies due to the range of products and services they are considering in the energy arena, including wind, solar and nuclear.

My student told me about the excitement and the challenges living and working on a platform rig in the middle of the ocean, confirming the grit and resilience needed to survive and thrive on the platform was a non-negotiable skill that had to be developed. I am sure that none of the engineers working on his team grew up on a rig — they were hired and trained in both the technical aspects and the core safety concerns required for the job. Teamwork, cooperation and resolve were central to be able to safely bring that particular product to market and provide a profitable year for the company. While we could all debate the best forms of energy in terms of costs, environmental impact and ethical issues, one thing is clear about energy: everyone needs it!

In contrast to technical energy, personal energy comes from within and from without. There are three phases of personal energy management: acquisition, conservation and exertion. It is important to NOT overexert yourself in order to prevent career burnout. There are three key career areas that require

energy: developing authentic personal interactions, creating positive work habits and executing ethical technical practices. While we can't control the actions (or the responses) of others, we can try our best to manage what I call "energy builders" and "energy zappers." Energy builders include: positive people, intellectual growth opportunities and celebrations of large and small accomplishments. Energy zappers requiring management include debilitating conversations, ongoing trivial work assignments and continuous disregard for your contributions. The intellectual, emotional and even physical energy we exert can be replenished with rest, spending time with friends and doing enjoyable non-STEM activities.

The internal fortitude to compete during STEM training, complete STEM training and then to compete with other STEM-trained individuals in a career is critical. Some may assert that a career in STEM is a collaborative endeavor, and that is true in the sense that teamwork and collective inclusion of a diverse set of ideas and perspectives creates a rich technical outcome. However, each gate that needs to be passed in both the academic and career realms is often approached solely by the individual; it is a competitive endeavor. Finding your own pathway requires the energy exertion, energy conservation and energy acquisition. Make sure you have the right balance as you empower yourself for success!



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