

# SAFETY PROFESSIONALS Change Agents for Climate

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**A CHANGE AGENT** is a person who suggests performance improvements and inspires the organization to become engaged and then to transform (DeRose, 2004). Thus, a change agent serves as a catalyst to bring about some sort of organizational change, which could be large or small and could have great or limited impact depending on the context. A more reflective view of change agents is that they assess the present, are controllably dissatisfied with it, contemplate a future that should be, and take action to achieve the changes necessary to achieve the desired future (Manuele, 2015). In short, a change agent advances organizational performance. Does this sound like a characteristic, critical role that safety professionals typically have in organizations? The authors think so.

## Safety Professionals as Change Agents

It has been said that a safety professional's most effective role is that of leader and change agent (DeRose, 2004). Manuele (2015) pointedly states, "Think about it. Are not most safety professionals primarily providers of advice to achieve change?" Kello (2005) adds, "Modern safety professionals are agents for positive change in their organizations. They are trying to build deep working relationships that allow them to effect constructive change through influence, even when the client system may not want to change."

Safety professionals adopt various roles as change agents that affect work systems and diverse work areas such as implementing or promoting mental health, psychological safety and employee assistance programs in organizations. From a system perspective, they could act as organizational, safety culture, business management system or behavioral change agents as determined through a literature review (Table 1).

## KEY TAKEAWAYS

- Safety professionals are change agents, making them uniquely qualified to lead their organizations to carbon neutrality and sustainability.
- Safety professionals have the necessary skills to be climate action change agents because they are risk management experts, excellent communicators, educators, consensus builders and unifiers—all attributes needed to catalyze organizational climate action. They also tend to be altruistic, driven by a desire to protect people, which makes them ideal climate stewards.
- Communicating climate change and mitigation through a safety and health framework is the best motivating framework in which to take mitigating actions.
- Safety professionals can help their organizations become carbon-neutral by adopting a continual improvement approach with adapted hierarchy of controls that can be integrated into their business management systems.

## Some Keys to Safety Professionals' Success as Change Agents

Safety professionals must help their organization know the value of intended change. Part of safety professionals' challenge is to help people understand why change is needed (DeRose, 2004), especially if it is contrary to achieving other organizational goals. Many safety professionals already work in environmental, safety and health positions, and thus should have some experience in explaining why change is needed for environmental initiatives. To be successful culture change agents, safety professionals must operate within the business framework of the organizations they support. Change agents should be well versed in those organizational factors that shape outcomes. To become effective change agents, safety professionals must understand the ways in which their leaders are shaping culture (through their behaviors, decisions and influence styles) and what impact that is creating on safety functioning. As change agents, safety professionals must alert leaders when they are taking limited or short-term views, challenge any strategy that will not deliver sustainable improvement, then provide sound recommendations for how to proceed (Groover, 2008).

Safety professionals can hone their change agent skills by focusing on principles embodied in ANSI/ASSP (2019) Z10.0, Occupational Health and Safety Management Systems, in that "the planning process goal is to identify and prioritize OHSMS issues (defined as hazards, risks, management system deficiencies and opportunities for improvement)." Safety professionals must be aware that hazardous situations are indicators of management system deficiencies that relate to the existence of these situations, and that corrective actions (e.g., changes) must eliminate those deficiencies to be deemed adequate (Manuele, 2015).

Change agents in safety do not leave their technical expertise behind in their role as change agents; they simply leverage it to develop strategies for sustainable, high-level performance. The difference between being a technical expert and change agent is analogous to the difference between a manager and a leader. A technical expert is concerned with the "what" of the safety objective and in executing the particulars, while the change agent is concerned with the "how" of the objective and with guiding the strategy (Groover, 2008).

Safety professional strategists are also becoming important factors in introducing the concept of a learning organization within a company or organization. The underlying message is that one can realize change only if one understands and respects the mechanisms that drive organizations. Change is, in this vision, a synonym for organizational learning (Swuste & Arnoldy, 2003).

Safety professionals have always been organizational and culture change agents and a means for embracing organizational learning. By recognizing the reality of this role, safety professionals could become effective in being broader change agents

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in related areas. They can counsel management and influence decisions in diverse areas such as climate action.

### Safety Professionals as Climate Action Change Agents

Safety professionals can act as organizational change agents; this alone could be a topic of investigation. However, this article concentrates on the specific role of safety professionals as climate action change agents. This is due to the realization that safety professionals are being increasingly assigned environmental and sustainability duties in organizations. In addition, it has been found that incident rates are reduced when additional responsibilities, such as environmental responsibilities, are added to a safety professional's role (Provan et al., 2017). And finally, from personal interactions with numerous organizations, many institutions are currently or planning to pursue climate change action initiatives due to the perceived importance of this topic for them. Safety professionals can play a critical role as change agents in climate change prevention or minimization in their organizations. First, as noted, safety professionals serve in change agent roles already. In addition, many safety professionals are likely managing environmental aspects of their business and may even have responsibilities for greenhouse gas reduction.

Safety professionals are often risk management experts and may be uniquely qualified to help their companies understand the hazards, risks and appropriate controlling actions in response to climate change. Safety professionals are also typically excellent communicators, educators, consensus builders and unifiers—all attributes needed to catalyze organizational climate action.

Those who remain as safety professionals throughout their careers tend to be altruistic, driven by a desire to protect people, which makes them ideal climate stewards. Safety professionals' altruistic motivations solidify their role as long-term unifiers and climate action change agents.

### Climate Change & Mitigation From a Safety & Health Risk Management Perspective

A mismatch exists between the level of risk associated with climate change impacts and the preventive and mitigating actions that have been taken over the past 40 years. While historical media practices on presenting political issues to the public have given equal coverage of opposing sides, unfortunately, when this approach has been applied to scientific and public safety issues, it has led to misconceptions and politicization of these types of issues and stagnation of actions (Boykoff & Boykoff, 2004; Lewandowsky, Mann, Brown et al., 2016; Malka et al., 2009). This article does not attempt to present climate change or climate science as a political issue and focuses on reports that have been validated through the scientific method and peer-review process

and that have been synthesized by both the U.S. government [for instance, the Fourth National Climate Assessment (Jay et al., 2018) is the latest of these reports] and synthesis reports from the Intergovernmental Panel on Climate Change (IPCC, 2018, 2022). Social sciences articles referenced in this publication are those that have used scientific methods in their investigation and peer-review process for publication.

Between 97% and 100% consensus exists among publishing climate scientists that climate change is happening and is human

**TABLE 1**  
**SAFETY PROFESSIONALS' CHANGE AGENT SYSTEM ROLES**

Role	Reference
Safety professionals' role is to provide advice to decision makers on hazards, risks and deficiencies in management systems so that changes can be enacted to achieve acceptable risk levels and culture change.	Manuele, 2015
Safety professionals' mission is to identify performance barriers in the business management system that inhibit safety performance, then to suggest changes that will enhance the system's performance.	Petersen, 1996
Safety professionals act as agents of change, both with respect to the technology of the company and the design of its workplaces, and in the organization of the company's health and safety management system.	Swuste and Arnoldy, 2003
Safety professionals are often drawn into discussions about behavior, namely, how they get people to change their behavior to do the right things in the right way.	Groover, 2008
Only by modifying the way things get done can safety professionals overcome management system deficiencies, that is, only if an organization's culture is changed with respect to its system of expected performance. Thus, the safety professionals' overarching role may be that of a culture change agent.	Manuele, 2015

caused (Cook et al., 2016). There is nearly inexhaustible scientific literature on climate change and its projected impacts. Several synthesis reports serve as peer-reviewed assessments of the literature. Two recent sources of these synthesis reports are from the U.S. government [with its most recent report, the Fourth National Climate Assessment (Jay et al., 2018)] and the UN's IPCC (with its most recent report, Climate Change 2022: Mitigation of Climate Change). In its 2018 special report, "Global Warming of 1.5 °C," IPCC urges capping warming to 1.5 °C above pre-industrial levels by the year 2100 to stave off the worst effects of climate change. Since human activities have already been linked to causing 1 °C of warming, meeting this objective requires a sharp decrease in greenhouse gas emissions (50% reduction) by year 2030 and achieving net-zero emission by year 2050. This is a tall order, but necessary to minimize existential threats to human life.

IPCC's (2022) most recent report confirms that many people around the globe are already experiencing the harmful effects of climate change. These impacts will become more severe as the planet warms since we are locked into more warming due to the nature of carbon dioxide and other greenhouse gases that remain in the atmosphere for long periods (hundreds to thousands of years). However, if warming is capped at 1.5 °C

by 2100, Earth, ecosystems and humanity, with adaptations, will have much better outcomes than continuing on the current emissions trend that is expected to result in temperature rise of 5 °C by century's end (Tollefson, 2020).

In the U.S. alone, some of these impacts include more severe wildfires, wildfire-related fatalities, respiratory hazards associated with fire smoke, greater prevalence of severe storms, excessive flooding in some regions (e.g., the midwestern U.S.) and extreme droughts in other regions (e.g., the southwestern U.S.), rise in vector-borne illness and fatalities, temperature extremes, a rise in heat-related illness and fatalities, and impacts on food production (Jay et al., 2018). Globally, at current warming trends, a 50% decrease in food production is predicted by 2100 (IPCC, 2018), with a projected population growth of 3.6 billion in the same period (UN, n.d.).

All these issues can pose immediate safety and health hazards. The response to climate change should be no different than how safety professionals would respond to workplace hazards where they assess the likelihood and severity of the impacts, apply controls using a hierarchy of controls, and adopt a plan-do-check-act (PDCA) follow-up approach to ensure that the controls are effective and to continually improve. The assessments provided

**FIGURE 1** RISK MATRIX BASED ON ISO 31000, ISO 45001 & ANSI/ASSP Z690 STANDARDS

			Consequence	1 Minor	2 Moderate	3 Major	4 Severe	5 Catastrophic
<b>Extreme risk: These risks are unacceptable. Do not proceed without addition controls.</b>			•minor injury/illness not requiring medical aid •nonserious facility or equipment damage •an activity or incident with insignificant effect on the environment		•injuries/illness requiring medical aid •minor subsystem loss facility or equipment damage •mild pollution on site, full recovery could be expected within 24 hours if activity stopped, very minor contributor to off-site environmental impacts	•lost-time injuries/illnesses •moderate subsystem loss/equipment •moderate pollution on-site causing temporary disruption to ecosystems, no residual effect on ecosystems if activity is stopped or corrected, minor contributor to off-site environmental impact	•severe or permanent disabling injury or illness, amputations, hospitalization •major subsystem or facility damage •severe pollution causing damage to ecosystems, recovery of damage within a year, possible substantial contributor to off-site environmental impact	•fatality or multiple life-threatening injuries •system or facility loss •environmental release with lasting environmental or public health impact
<b>High risk: Action required within a set time frame.</b>								
<b>Medium: Further study or action may be needed.</b>								
<b>Low: Maintain existing controls.</b>								
<b>Likelihood</b>	<b>5</b>	<b>Almost certain</b>	> 1 in 10 •is expected to occur in most circumstances •similar events occurred more than five times per year •continuous exposure with minimal or no controls	<b>M</b>	<b>H</b>	<b>H</b>	<b>E</b>	<b>E</b>
	<b>4</b>	<b>Likely</b>	1 in 10 to 100 •will probably occur •similar events have occurred between one and five times per year •exposure one time per day with minimal or no controls	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>E</b>
	<b>3</b>	<b>Possible</b>	1 in 100 to 1,000 •might occur at some time in the future •similar events occurred more than one time in 5 years •exposure one time per month with minimal or no controls	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>
	<b>2</b>	<b>Unlikely</b>	1 in 1,000 to 10,000 •could occur but doubtful •similar event occurred more than one time in 10 years •occasional exposure	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>
	<b>1</b>	<b>Rare</b>	1 in 10,000 to 100,000 •may occur but only in exceptional circumstances •no events in more than 10 years •no exposure	<b>L</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>

by the world's leading scientists on the subject have thoroughly assessed likelihood and consequences. If assessing likelihood of occurrence and consequences presented by both IPCC and Fourth National Climate Assessment (Jay et al., 2018) reports using a five-by-five risk matrix (Figure 1), the likelihood of occurrence without risk treatment is certain and would be given a top likelihood rank of 5. Since consequences include potential fatalities, this would also be given a top rank of 5. This risk matrix is one typically used in industry to characterize the likelihood and severity of risks and a guide in selection of appropriate risk treatment. Using a risk matrix, the risk level and risk treatment guidance indicates extreme risk and the only appropriate option is immediate risk treatment. However, this is not what has been done in terms of climate action because most people do not view climate change from a personal safety and health context that can be treated through a safety and health risk management framework (Mullins-Jaime, 2021). Rather, the authors believe many adopt the perspective that climate change is an external global concern that can only be managed through global actions and that any single organizational or individual action will have little impact on change. This can lead to a misperceived sense of organizational and individual powerlessness.

A recent study assessed the impact of a communication intervention to motivate personal climate action (Mullins-Jaime, 2021). The intervention used a safety and health risk management framework. This interventional study found that by 1. framing climate change as a safety issue, 2. providing basic indisputable climate science facts, 3. discussing solutions to the problem through a safety and health risk management framework, 4. presenting a hierarchy of controls, and 5. discussing a continual improvement approach, personal motivation for climate action significantly increased. Those who prioritized climate change as a safety and health issue and were motivated to act from safety and health context had higher motivation for action than those who prioritized it through other contexts (e.g., environmental, economic). Further, presenting climate change through this framework significantly changed personal beliefs that serve as antecedents to motivation. These beliefs include that climate change is caused by humans (anthropogenicity), climate change affects one personally, and humans can resolve the climate crises (Figure 2). The communication intervention also shifted the types of action preferences toward more impactful choices.

Effective communication on climate change and adopting a continual improvement pathway can help overcome some of the traditional barriers to climate action as people and organizations can take immediate actions. Even if just small steps at first, by continually assessing and taking additional steps and repeating the process, they can build momentum that can eventually lead to carbon neutrality. This process is synonymous to a management system approach that most large organizations already use in which they follow a PDCA process to meet business, safety, environmental, and risk management objectives and to continually improve. Safety professionals are well suited to spearhead this PDCA risk management approach within their organizations, as they are experts in risk assessment and control and could easily integrate emission reduction or elimination into their overall risk management strategy.

### Barriers Safety Professionals Might Face in Championing Climate Action

There are pragmatic barriers to adopting climate change action duties and emissions-free alternatives including time constraints, technological limitations and costs.

## FIGURE 2 BELIEFS THAT SERVE AS ANTECEDENTS TO CLIMATE ACTION MOTIVATION



It is possible that if safety professionals have another responsibility (as climate action change agent) added to their list of job functions, which some believe is already too long and often ambiguous (Minnick, 2013), various effects could result, such as increased stress due to job overload and the dilution of a safety professional's focus from short-term, more immediate concerns to longer-term issues. In a way, this might be beneficial for safety professionals to have more strategic, impactful, longer-term functions assigned to them with potentially greater organizational impact and visibility, rather than short-term reactive ones (e.g., putting out constant fires that only the affected parties witness). But nonetheless, higher-level managers must be cognizant of the time commitments required for safety professionals to become organizational climate action change agents and prioritize duties and expectations and who performs them. This situation could also serve as the catalyst to reexamine and eliminate less value-added safety roles, responsibilities and processes or emphasize those safety roles, responsibilities and processes that are more proactive in nature.

Beyond practical barriers, there are psychological barriers that have and continue to prevent people and, indirectly, organizations from responding to climate change (Gifford, 2011). A main barrier is personal worldview. If the mitigating response threatens one's way of life or identity with social and cultural groups (personal worldview), individuals and organizations are more likely to deny climate science and rebuke climate action (Campbell & Kay, 2014; Lewandowsky, Gignac et al., 2013; Lewandowsky, Mann, Brown et al., 2016). Another are the concepts of "ancient brain" and "environmental numbness" (Gifford, 2011), whereby if one's environment is not immediately causing harm, people tend to ignore distal issues that are not happening directly to them or are expected to occur in the foreseeable future. There have also been shortcomings in climate communication where too much emphasis was placed on creating fear of the problem with little emphasis on the solutions (Moser & Dilling, 2011). This is called the "overkill backfire effect" (Farmer & Cook, 2013) that has created dissonance in perceptions and the appropriate responses.

Climate science denial and rejection of anthropogenicity was a tactic effectively employed to cast doubt of the scientific consensus (Lewandowsky, Mann, Bauld et al., 2013; Lewandowsky,

Oreskes et al., 2015; Oreskes & Conway, 2011). However, more recently in the wake of overwhelming evidence of climate change impacts, there appears to be a shift in the contrarian argument from flat-out denial to casting doubt on the severity of the impacts. The safety professional may encounter any and all of these barriers when communicating climate change as an issue and in rallying organizational and employee support to reduce or eliminate emissions.

### Adopting a Continual Improvement Approach With Adapted Hierarchy of Controls

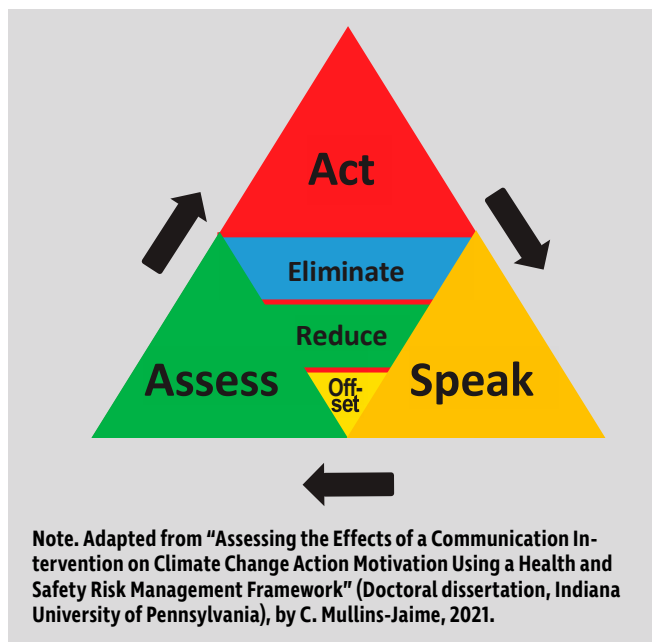
Safety professionals can catalyze climate action in their workplace by integrating the following approach into their risk management strategy (Figure 3).

The activities described in the continual improvement approach for climate action include both micro and macro interventions to climate change. Many can be implemented by safety professionals, while others such as facility managers, procurement officials and senior executives may need to be involved. However, like the role of a safety management system representative (in some safety management system consensus standards), a climate action change agent can become the coordinator of these various actions regardless of the implementation level within the organization, and thus should be cognizant of all interventions that can possibly be used to combat climate change. Additional information and examples of activities are provided in the continuous improvement steps as guidance for those with limited knowledge or experience in this area.

#### Step 1: Assess

- Assess the organization's activities and inputs.
- Determine if and how the organization emits or creates demand for emissions of the following greenhouse gases: carbon dioxide, methane, nitrous oxide and fluorinated gases.

**FIGURE 3**  
**CONTINUAL IMPROVEMENT APPROACH FOR CLIMATE ACTION**



- Calculate or estimate how much emissions they directly and indirectly generate.

Safety professionals who hold responsibility for their organization's environmental management system already conduct aspect and impact analyses as part of their ISO 14001 certifications (ISO, 2015). This step is not much different and could be included in their environmental management system activities. It is important to assess all business aspects from a life cycle perspective evaluating not only the downstream impacts in terms of creating greenhouse gas (GHG) emissions but also evaluating if and how the organization creates demand for GHG emissions through its supply chain of material and service inputs.

#### Step 2: Act

- Act to eliminate GHG emissions following an adapted hierarchy of controls.

##### Eliminate

- If at all practicable for the organization, opt for carbon elimination choices, such as holding meetings online versus having employees commute or fly to meet in person.
- Opt for emissions-free forms of energy to power the business, such as solar, wind and geothermal.
- Use emissions-free forms of transportation.
- Use only emissions-free inputs (if possible) to create the organization's services or products.

##### Reduce

Full GHG emissions elimination may not be possible or practical to implement right away. Some organizations may also have to generate some emissions coupled with sequestration offsets. However, every organization can do something to reduce emissions. Following are some examples of how to reduce:

- If the organization's power supply relies on burning fossil fuels, find ways to reduce energy consumption including creative ways such as painting roofs white versus dark colors. This helps in southern climates and during summer months to reduce electrical consumption from cooling. This can also save the organization a lot of money.
- If the organization has not already done so, switch to LED lighting to reduce lighting consumption by 90% compared to incandescent bulbs and put lighting on sensors and timers to avoid unneeded usage.
- If the company manufactures products, reduce emissions by reducing the packaging waste on products. Particularly, if products have a lot of plastic and resource rich materials that require burning fossil fuels to create, consider changing packaging to renewables or to materials that require fewer emissions to create.
- Source products and service inputs that have lower climate impact, such as using recycled or repurposed materials, transporting items using emissions-free transport, buying locally sourced products (if low emissions) or purchasing from companies that have achieved carbon neutrality.
- Adopt circular economy principles by making products that last longer and have parts that can be reused or repurposed.
- Eliminate single-use goods such as disposable containers and utensils if possible or opt for ones that have lower climate impact.
- Reduce food waste and compost food waste versus landfill disposal. The aerobic process in composting prevents methane generation, a potent GHG.

If organizations have been on the carbon neutrality pathway for a while, they may be partially or fully electric in their trans-

portation and emissions-free in their energy consumption. Making this switch alone could reduce overall emissions by 60% to 70% depending on total emissions calculated in Step 1, but their upstream inputs and raw materials may not be fully carbon neutral or perhaps no elimination options are practicable for them at this time. However, they can continue to reduce by evaluating their inputs and outputs for opportunities.

### Offset/Sequestration

This step involves removal of atmospheric greenhouse gases. While some technologies are in use to draw carbon dioxide from the atmosphere and store it in underground reservoirs in higher volumes than natural processes, sequestration is also achieved through organic life such as green spaces, plants, forests or seaweed farms to draw carbon from the atmosphere and hold it until the plant dies. Some recommendations include:

- Use plant-resilient, diverse and long-lived species.
- Mow grounds less frequently to allow deeper root systems that can help make small improvements in sequestration.
- Add more green spaces or improve the sequestration in existing green spaces. Adding trees and green spaces will also aid in climate change adaptation for regions expected to experience floods as trees and green spaces serve to soak up floodwaters (Angel et al., 2018).

An indirect form of offset is through purchasing carbon offset credits. Some offsets invest in direct capture technologies while others pay to reduce emissions from other companies or sources on behalf of the company that continues to emit greenhouse gases. While sequestration may be a necessary part of addressing the climate crises, and organizations should opt for offsets if they have maximized their elimination and reduction ability, it is an inferior control in the hierarchy since more impactful solutions lie in upstream change to eliminate and reduce the need for emissions given existing technology. Thus, as much effort as possible should be placed on the elimination and reduction steps of this hierarchy.

### Step 3: Speak/Communicate

All of these steps will likely require shifting value systems, where eliminating and reducing carbon and using sustainably produced products and services will hold value in the minds of both the people working within organizations on the carbon neutrality journey and in the minds of consumers and the general public. Education and communication efforts should be prioritized to inform people of the importance of climate change mitigation and the value of sustainable choices.

Promote communication throughout the organization and encourage everyone to share their ideas and climate action practices both inside and outside the organization. This step can help innovation, improve technology and the likelihood of success in achieving the climate neutral goal. Further, it can help shape values.

A 2007 study found people were more inclined to accept information about risk and danger when it came from someone who shares their values than when it came from someone who holds opposing commitments (Kahan et al., 2007). Even though shared values are critical to shifting culture (Schein, 2010), according to the latest report from Yale Program on Climate Change Communication and George Mason University Center for Climate Change Communication, most Americans “rarely” or “never” discuss climate change with family and friends. Thus, promoting communication is an important step in creating support and accelerating climate action. Since safety

professionals are natural communicators due to their inherent safety information dissemination and relationship-building functions, they can serve as critical communicators regarding climate change and actions within their organizations.

### Step 4: Repeat

The last step in this PDCA-type process is to repeat.

- Continually evaluate the organization’s carbon footprint and act to improve until the carbon footprint is net-zero.

This process aligns with most organizational management systems and can be easily integrated into existing models. Many organizations have already done so by setting carbon neutrality targets and creating programs necessary to achieve them. Once the organization fully assesses and calculates their emissions as the baseline, the organization can set requirements for annual, quarterly and even monthly assessments. They will need to create programs and allocate resources necessary to make progress on GHG elimination, reduction, and sequestration and monitor their performance on a set frequency. A continual improvement process is more likely to be effective in achieving carbon neutrality since it is meant to drive success through a progression of accomplishments. Because the goals are set to be specific, measurable and time bound and are monitored frequently, when it is found that the organization is off-track in meeting its goals, efforts can be made to make changes to get on track. Safety professionals are expert at establishing performance goals and measuring and trending performance. They could provide invaluable support in this area due to their knowledge and experience to organizations.

### Preparing Safety Professionals in Their Roles as Climate Action Change Agents

Safety professionals acting as climate action change agents is another example of an opportunity to add organizational value. However, it is recognized that this area or role may be new for many safety professionals and training may be needed for them to be able to contribute successfully to their new function and to add organizational value. It is suggested that safety professionals read the recent synthesis reports on climate change, since part of their climate action change agents’ duties may include convincing managers and employees as to the nature, extent and urgency of the concern. These sources include the UN’s IPCC (2018; 2022) reports. In addition, training on risk assessment, understanding PDCA processes (including continual improvement philosophy) and hierarchy of environmental controls could assist novice safety professional change agents in their new roles.

### Conclusion

Safety professionals are organizational change agents. Climate change impacts are hazardous to human safety and health and require action at all levels, including at the organizational level. By viewing climate change as a safety and health risk, organizations can manage this risk by adopting approaches commonly used in the safety profession. The authors propose organizations use an assess-act-speak-repeat process to deal with the threat of climate change to spur incremental climate action in organizations. Safety professionals can serve as critical change agents in developing and implementing this process. **PSJ**

### References

- Angel, J., Swanston, C., Boustead, B.M., Conlon, K.C., Hall, K.R., Jorns, J.L., Kunkel, K.E., Lemos, M.C., Lofgren, B., Ontl, T.A., Posey, J., Stone, K., Takle, E. & Todey, D. (2018). Midwest. In D.R. Reidmiller, C.W. Avery,

D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock & B.C. Stewart (eds.), "Fourth National Climate Assessment: Volume II, Impacts, risks, and adaptation in the United States" (pp. 872-940). U.S. Global Change Research Program. <https://nca2018.globalchange.gov/chapter/21>

ANSI/ASSP. (2019). Occupational health and safety management systems (ANSI/ASSP Z10.0-2019). <https://bit.ly/3wdzs43>

Boykoff, M.T. & Boykoff, J.M. (2004). Balance as bias: Global warming and the U.S. prestige press. *Global Environmental Change*, 14(2), 125-136. <https://doi.org/10.1016/j.gloenvcha.2003.10.001>

Campbell, T.H. & Kay, A.C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. *Journal of Personality and Social Psychology*, 107(5), 809-824. <https://doi.org/10.1037/a0037963>

Cook, J., Oreskes, N., Doran, P.T., Anderegg, W.R., Verheggen, B., Maibach, E.W., Carlton, J.S., Lewandowsky, S., Skuce, A.G., & Green, S.A., Nuccitelli, D., Jacobs, P., Richardson, M., Winkler, B., Painting, R. & Rice, K. (2016). Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters*, 11(4), 048002. <https://doi.org/10.1088/1748-9326/11/4/048002>

DeRose, A.J. (2004, March). The SH&E professional: Leader and change agent: Inspiring organizational transformation and improvement. *Professional Safety*, 49(3), 40-43.

Farmer, G.T. & Cook, J. (2013). *Understanding climate change denial. In Climate Change Science: A Modern Synthesis* (Vol. 1: The physical climate; pp. 445-466). Springer.

Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist*, 66(4), 290-302. <https://doi.org/10.1037/a0023566>

Groover, D. (2008, May 1). The emerging role of the safety professional: Part 2. *Occupational Health and Safety*. <https://bit.ly/3XoZ61o>

Intergovernmental Panel on Climate Change (IPCC). (2018). Summary for policymakers. In V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (Eds.), *Global warming of 1.5 °C: An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development and efforts to eradicate poverty* (pp. 3-24). Cambridge University Press. [www.ipcc.ch/sr15/chapter/spm](http://www.ipcc.ch/sr15/chapter/spm)

IPCC. (2022). *Climate change 2022: Mitigation of climate change. Contribution of Working Group III to the sixth assessment report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. [www.ipcc.ch/report/ar6/wg3](http://www.ipcc.ch/report/ar6/wg3)

International Organization for Standardization (ISO). (2015). Environmental management systems—Requirements with guidance for use [ISO 14000:2015]. [www.iso.org/standard/60857.html](http://www.iso.org/standard/60857.html)

Jay, A., Reidmiller, D.R., Avery, C.W., Barrie, D., DeAngelo, B., Dave, A., Kolian, M., Lewis, K., Reeves, K., Winner, D.A. & Dzaugis, M. (2018). Summary findings and overview. In D.R. Reidmiller, C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, K. Reeves & D. Winner (eds.), "Fourth National Climate Assessment: Volume II, Impacts, risks and adaptation in the United States" (pp. 33-71). U.S. Global Change Research Program. <https://nca2018.globalchange.gov/chapter/1>

Kahan, D.M., Braman, D., Slovic, P., Gastil, J. & Cohen, G.L. (2007). The second national risk and culture study: Making sense of—and making progress in—the American culture war of fact (GWU Legal Studies Research Paper No. 370, Yale Law School, Public Law Working Paper No. 154, GWU Law School Public Law Research Paper No. 370, Harvard Law School Program on Risk Regulation Research Paper No. 08-26). <https://doi.org/10.2139/ssrn.1017189>

Kello, J. (2006). Changing the safety culture: Safety professional as change agent. *The International Journal of Knowledge, Culture and Change Management: Annual Review*, 6(4), 151-156. <https://doi.org/10.18848/1447-9524/CGP/v06i04/49316>

Lieserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., Neyens, L., Marlon, J., Lacroix, K. & Goldbery, M. (2021). Climate change in the American mind, September 2021. Yale Program on Climate Change Communication, George Mason University Center for Cli-

mate Change Communication. <https://bit.ly/3iQuvLi>

Lewandowsky, S., Gignac, G.E. & Oberauer, K. (2013). The role of conspiracist ideation and worldviews in predicting rejection of science. *PLOS ONE*, 8(10), e75637. <https://doi.org/10.1371/journal.pone.0075637>

Lewandowsky, S., Mann, M.E., Bauld, L., Hastings, G. & Loftus, E.F. (2013). The subterranean war on science. *Observer*, 26(9). <https://bit.ly/3WCCEkl>

Lewandowsky, S., Mann, M.E., Brown, N.J.L. & Friedman, H. (2016). Science and the public: Debate, denial and skepticism. *Journal of Social and Political Psychology*, 4(2), 537-553. <https://doi.org/10.5964/jssp.v4i2.604>

Lewandowsky, S., Oreskes, N., Risbey, J.S., Newell, B.R. & Smithson, M. (2015). Seepage: Climate change denial and its effect on the scientific community. *Global Environmental Change*, 33, 1-13. <https://doi.org/10.1016/j.gloenvcha.2015.02.013>

Malka, A., Krosnick, J.A., Debell, M., Pasek, J. & Schneider, D. (2009). Featuring skeptics in news media stories about global warming reduces public beliefs in the seriousness of global warming. Woods Institute for the Environment, Stanford University. <https://stanford.io/3Xm7U8w>

Manuele, F.A. (2015, Dec.). Culture change agent: The overarching role of OSH professionals. *Professional Safety*, 60(12), 38-44.

Minnick, W. (2013). Understanding the antecedents of role stressors in the safety professional. *Journal of Workplace Behavioral Health*, 28(2), 134-157. <https://doi.org/10.1080/15555240.2013.779520>

Moser, S.C. & Dilling, L. (2011). Communicating climate change: Closing the science-action gap. In J.S. Dryzek, R.B. Norgaard and D. Schlosberg (Eds.), *The Oxford Handbook of Climate Change and Society* (pp. 161-174). Oxford Academic. <https://doi.org/10.1093/OXFORDHB/9780199566600.003.0011>

Mullins-Jaime, C. (2021). *Assessing the effects of a communication intervention on climate change action motivation using a health and safety risk management framework* (Publication No. 10289373) [Doctoral dissertation, Indiana University of Pennsylvania]. ProQuest Dissertations Publishing.

Oreskes, N. & Conway, E.M. (2011). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Publishing.

Petersen, D. (1996). *Analyzing safety system effectiveness* (3rd ed.). Wiley.

Provan, D.J., Dekker, S.W.A. & Rae, A.J. (2017). Bureaucracy, influence and beliefs: A literature review of the factors shaping the role of a safety professional. *Safety Science*, 98, 98-112. <https://doi.org/10.1016/j.ssci.2017.06.006>

Schein, E.H. (2010). *Organizational culture and leadership* (4th ed.). Wiley.

Swuste, P. & Arnoldy, F. (2003). The safety advisor/manager as agent of organizational change: A new challenge to expert training. *Safety Science*, 41(1), 15-27. [https://doi.org/10.1016/S0925-7535\(01\)00050-9](https://doi.org/10.1016/S0925-7535(01)00050-9)

Tollefson, J. (2020). How hot will Earth get by 2100? *Nature*, 580, 443-445. <https://doi.org/10.1038/d41586-020-01125-x>

UN. (2017, June 21). World population projected to reach 9.8 billion in 2050 and 11.2 billion in 2100 [Press release]. <https://bit.ly/3iV70eK>

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