

## Ergonomics and Sustainability: Converging Imperatives

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## DESCRIPTION

The fields of ergonomics and environmental sustainability have historically developed along parallel but largely separate paths. Ergonomics has focused on optimizing the relationship between humans and their immediate work environment to enhance performance and well-being, while sustainability initiatives have addressed broader ecological impacts of organizational activities. However, emerging research and practice suggest these disciplines are increasingly converging around shared objectives and methodologies. This commentary explains the intersection of ergonomics and sustainability, arguing for integrated approaches that simultaneously advance human and environmental health.

The conceptual overlap between ergonomics and sustainability becomes evident when examining their fundamental principles. Both fields emphasize systems thinking, recognizing that interventions in complex systems produce cascading effects across multiple domains. Both prioritize resource optimization, whether those resources are human capabilities or natural materials. Perhaps most significantly, both fields take a preventative approach, seeking to design systems that avoid problems rather than treating symptoms after they emerge. This theoretical alignment manifests in several practical areas where ergonomic and sustainability objectives coincide. Consider workspace illumination: Ergonomic lighting designs that optimize visual performance and comfort typically incorporate natural light supplemented by task-specific artificial lighting. This approach not only supports human visual function but also reduces energy consumption compared to uniform high-intensity overhead lighting. Similar synergies exist in thermal comfort, where personalized microclimate controls can simultaneously improve comfort and reduce Heating, Ventilation, and Air Conditioning (HVAC) energy demands.

Transportation represents another domain where ergonomics and sustainability intersect. Active commuting options like cycling or walking, when supported by appropriate infrastructure and facilities, deliver both health benefits to employees and reduced carbon emissions. Companies that have implemented comprehensive active transportation programs report decreased

absenteeism and healthcare costs alongside progress toward carbon reduction targets-exemplifying the potential for dual benefits. The built environment provides particularly rich opportunities for integration. Biophilic design elements such as indoor plants, natural materials, and views of nature contribute to psychological restoration and cognitive performance while often incorporating sustainable materials and supporting biodiversity. Building layout decisions that facilitate movement and social interaction can simultaneously reduce energy consumption by decreasing elevator usage and artificial lighting needs.

Equipment selection and maintenance practices illustrate further convergence points. Ergonomically designed tools that minimize required force and awkward postures typically demonstrate greater energy efficiency and longer service lives than their poorly designed counterparts. Participatory ergonomics processes that involve workers in identifying equipment improvements often reveal opportunities for material conservation and process efficiency that might be overlooked in top-down sustainability initiatives. Despite these natural alignments, organizational structures frequently impede integrated approaches. Ergonomics typically falls under occupational health and safety or human resources departments, while sustainability initiatives often reside within facilities management, corporate social responsibility, or dedicated sustainability units. This structural separation creates communication barriers, competing priorities, and missed opportunities for collaborative solutions. Several strategies can help overcome these barriers. Cross-functional teams comprising both ergonomics and sustainability professionals can identify opportunities for integrated interventions. Expanded assessment methodologies that simultaneously evaluate human and environmental impacts can ensure balanced decision-making. Professional development programs that expose practitioners from each discipline to core concepts from the other can foster shared understanding and collaborative problem-solving.

For ergonomics professionals specifically, several shifts in practice can advance this integration. First, expanding the temporal scope of ergonomic analysis to consider lifecycle

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impacts of recommended interventions ensures that solutions to immediate human problems don't create deferred environmental costs. Second, incorporating sustainability metrics into ergonomic evaluation frameworks provides quantifiable measures for communicating broader benefits to organizational leadership. Third, engaging with sustainability professionals as key stakeholders in ergonomic interventions creates opportunities for identifying synergistic solutions.

## CONCLUSION

The convergence of ergonomics and sustainability represents not merely an opportunity for more efficient organizational initiatives but a fundamental reconceptualization of the relationship between human work and environmental systems. By recognizing that human well-being is inextricably linked to ecological health, we can develop approaches that optimize across these dimensions rather than trading between them. This integrated perspective represents the natural evolution of both fields toward a more holistic understanding of organizational performance and responsibility.