ENERGY
FROM EFFICIENCY TO RESILIENCY

State compliance with Section 111(d) of the Clean Air Act, as prescribed by EPA's proposed Clean Power Plan, may drive the expansion of energy efficiency (EE) initiatives across the country *(see above, page 8)*. Community colleges are well-positioned to meet any subsequent increase in labor market demand, having been leaders in energy efficiency education over the past decade. Delivering skills through both stand-alone programs and career pathways within broader programs of study, community colleges offer everything from certificates to applied bachelors degrees in related fields of study (e.g. energy auditing, HVAC/R, building operations and maintenance, etc.).

Why start a discussion of new ideas on resilience with something as old hat as energy efficiency? To demonstrate possibility and promise within reach. To grasp the gestalt of resiliency, colleges need not develop entire new initiatives; they can fine-tune existing green construction programs and expand their principles to related fields of study and practice. What's more, bridges and pathways in energy efficiency offer logical entry points for low-income workers to enter and advance in high quality careers.

Los Angeles Trade Technical College, for example — which serves one of the lowest income communities in the country, and where the majority of students neither have a high-school degree nor speak English as a native language — has built successful, competency-based on-ramps to clean energy careers through construction prep and pre-apprenticeship and training academies for under-prepared students, leading to two stackable certificates (Energy Systems Technology Fundamentals and Weatherization & Energy Efficiency), and an AS Degree (Renewable Energy with Energy Efficiency Emphasis).[30] Up the coast in Washington State, Edmonds Community College offers a variety of sophisticated Energy Management Pathways to a student body composed primarily of adult workers. Based on skill profiles developed in partnership with Cascadia College, Washington State University, and a variety of industry partners, and funded by grants from the US Department of Labor and the National Science Foundation, Edmonds' 19-credit Energy Efficiency Technician Certificate and 17-credit Energy Management Core lead to stackable certificates in commercial lighting, energy accounting, residential auditing, building operations, and project management, which in turn ladder into two Energy Management degrees: associate of technical arts (96 credits) or associate of applied science-transfer (106 credits).[31] The latter opens the door to an Administrative Management (Business) degree at Central Washington University, and will ideally articulate to a of applied science degree at South Seattle College.

South Seattle's new Sustainable Building Science Technology BAS is a unique 90-credit degree that takes journey- and associates-level workers through a four-quarter sequence of advanced courses in building science, energy codes, building codes, and facility management. Developed in collaboration with over forty local businesses, the BAS is the latest innovation from a college with deep roots in South Seattle's industrial corridor, and a tradition of working in partnership with municipal, neighborhood, and labor leaders. South Seattle CC did not, in the words of one leader "drink the green tea." While other training providers in recent years rushed to sell short-term clean energy certificates with tenuous connections to employer demand, South Seattle was working to integrate sustainability across the curriculum and campus operations. They began with a simple but profound strategy: Ask scientists — and focus on economic and community development. Beyond developing a degree program, the college wanted to "build an infrastructure of knowledge around economic opportunity." This meant working closely with dozens of area employers; developing rigorous programs that could produce a workforce with higher math and science capacity; teaching leadership and policy as well as technical skills; and collaborating with other colleges.[32] It is an approach that itself embodies principles of resilience.

These are exemplary programs, innovative and robust, but not singular. Community colleges by their very nature expand the sort of educational and economic opportunity that undergirds resilient communities, and have in many regions taken the lead in responding to two decades of policy-driven fits and starts in energy efficiency. The SEED Center and others have lifted up myriad examples of excellence from the hundreds of colleges with energy efficiency programs. They are led by pioneers like Lane College in Oregon. Its nation-leading programs in building operations and campus sustainability started over thirty years ago with inquiries into energy management, and the college continues to innovate through new efforts like the Northwest Water & Energy Education Institute.[33] While the expansion of training has in some cases preceded the growth of jobs, much good work has been done during recessionary and other moments of slack demand to strengthen and standardize the supply side of the energy efficiency labor market. National efforts to document and validate required skills, benchmark career pathways in residential and commercial efficiency through certification schemes, and distinguish high quality programs and instructors bring value and order to an often chaotic training frontier.[34]

What is new here is not the content but the context. Energy efficiency in context of resiliency is a multi-layered response to climate risk. And this broader view of the industry widens the field of EE-related jobs and training: beyond energy auditors and weatherization crews, we see outcome brokers, community health workers, manufacturing technicians, procurement specialists, and others come into focus. Energy efficiency and resiliency principles will need to be integrated throughout related curricula, and can be employed to improve quality of life on campuses and in neighboring communities.

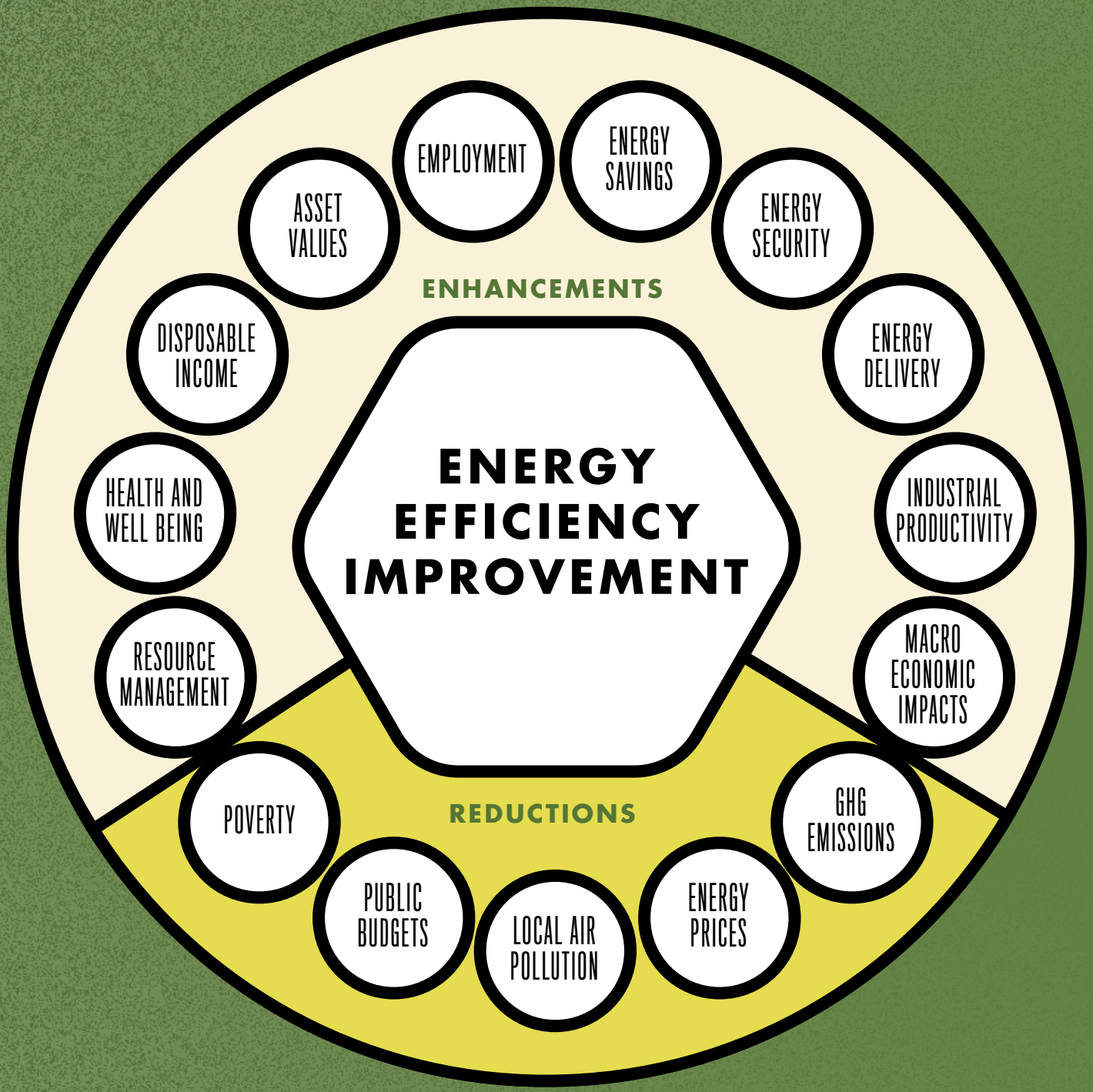
The International Energy Agency (IEA), in a new report measuring the real value of energy efficiency investment, finds that including health and well-being outcomes boosts cost-benefit ratios as high as 1:4 in building energy retrofits. In addition, the productivity and operational impacts of industrial efficiency measures can generate benefits up to 250 percent greater than the value of actual energy savings.[35] The quantitative results are impressive: worldwide, "harnessing economically viable energy efficiency investments" could potentially "boost cumulative economic output through 2035 by USD $18T," larger than the entire current US economy. But it is the report's simple graphic description of returns to EE investment that demonstrates the centrality of the industry to resilience *(see figure 2, page 22)*. Efficiency is typically categorized either as a) a mitigation strategy, reducing demand for energy reduces greenhouse gas emissions; or b) an adaptive one, reducing heating and cooling needs helps to offset temperature extremes that are increasing in degree and duration. According to the IEA, energy efficiency also *measurably* increases energy affordability and reliability
(by reducing "the amount of energy assets exposed to extreme weather events"), as well as indoor air quality, health, employment, productivity, and wealth.

This constellation of energy efficiency's socio-economic co-benefits reflects the interdependent, cross-sectoral imperatives of resiliency.

FIG 2

ENERGY EFFICIENCY CO-BENEFITS

This constellation of co-benefits reflects the interdependent, cross-sectoral imperatives of resiliency.



ADAPTED FROM THE INTERNATIONAL ENERGY AGENCY