Effectively Scaling Up Development Innovations Across Asia-Pacific

## Using Energy Efficiency to Re-Imagine Steel Production in India



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## Impact

- 15% of steel produced in the secondary steel sector (6.2 million tonnes per year) now employs energy-efficient methods
- Reduced average specific energy consumption by 24%; estimated energy saved is 79,000 tonnes of coal and 63 million units of electricity every year
- Reduced greenhouse gas emissions by 260,000 tonnes of carbon dioxide per year
- Substantially increased expertise/ professionalism in energy efficiency in smallscale steel units, from 10 to nearly 100 persons

## Uniqueness

- Multiple and innovative approaches to quickly reach out to steel units to sign up to implement energy efficiency, including through cluster meetings, e-networks, and presentations to the steel industry association.
- Facilitated even small investments by grouping a smaller number of technology solutions, so that average investments were US\$35,000, compared to US\$230,000 in earlier phase
- Extensive documentation (energy-efficient technology packages, reference manual on profits, posters) significantly helped in decision making by plant owners and greater understanding of interventions for supervisors and workers

## **Key Partnerships**

• Ministry of Steel, AusAid, Global Environment Facility

India is one of the largest producers of steel in the world, and small-scale steel re-rolling mills – which produce nearly two-thirds of long steel products in the country – typically are responsible for high levels of pollution and inefficient resource use. Overall, they consume about 1 percent of India's energy. However, an innovative partnership between UNDP and the Ministry of Steel, supported by GEF and AusAid, is helping companies in the steel re-rolling sector to demonstrate that the industry can become more energy efficient, more environmentally conscious – and more profitable. A technology-led development project, begun in 2013, has upscaled energy-efficient interventions in 285 secondary re-rolling mills and four induction furnace units, enabling mitigation of greenhouse gas (GHG) emissions and leading to improvements in productivity through substantial savings in energy costs. Now, 15 percent of steel produced in the secondary sector (6.2 million tonnes a year) is produced by energy-efficient methods.

In turn, this has reduced average specific energy consumption by 24 percent (431 megajoules of energy per tonne of steel), and together saved energy costs of US\$19 million annually. The estimated energy saved stands at 79,000 tonnes of coal and 63 million units of electricity every year. Moreover, GHG emissions have been reduced by 260,000 tonnes of carbon dioxide annually – an average of 913 tonnes of CO2 per year per steel unit – demonstrating a strong reduction for the industry's carbon footprint and a positive step for small and medium enterprises toward protecting the environment. Further, these achievements become even more important in light of the new Sustainable Development Goal on ensuring access for all to clean, affordable energy by 2030.

Notably, much of the investment in cleaner production processes in India has been driven by small mill owners themselves. Through using multiple and innovative approaches, including cluster meetings, e-networks and presentations to the steel industry association, UNDP was able to guickly reach out to steel units to sign up to implement energy efficiency. This resulted in leveraging public grants of about US\$3.8 million, from the Ministry of Steel, AusAid and UNDP, into US\$16 million from private steel units - a growth in investment by a factor of four. Here, the role of the Government was especially crucial: More than half of the initial grants (US\$2 million) were from the Ministry of Steel. The Government also co-chaired, with UNDP, a proactive project steering committee that offered guidance at every stage and resolved any issues.

In addition, breaking down interventions into smaller sets and grouping them as packages with different levels of investment requirements led to wider acceptability for implementation by a large number of units in a shorter period of time. It also meant that the average investment each steel unit needed to make likewise was small, at about US\$35,000 – down considerably from US\$230,000 each for energy-efficient measures some mills had implemented independently before the project began. Yet this small investment paid off big: 31 of the 34 pilot

units recorded INR 40 crore (US\$6 million) in fuel savings. Companies were able to pay back investments made in energy-efficiency measures in six to 18 months.

Impressed by pilot results, the Government guickly upscaled the project, reaching out to nearly 300 steel mills. Deepening the crucial role of the private sector as a key partner, many of the pilot units became champions by serving as resources for awareness programmes. They also allowed officials from the targeted steel units to come and witness the successful adoption of energy-efficient methods. And again, the Government role was central: When the project faced a funding deficit after scaling-up funds were exhausted, the Ministry UNDP's partnership with the Ministry of Steel is an exciting demonstration of how energy efficiency makes good business sense. If up-scaled to 1000 secondary steel units in the country, these low-risk, technology innovations could reduce energy consumption by upto 50%. In doing so, it can reduce 2.3 million tonnes of CO<sub>2</sub> emissions, roughly equal to taking all passenger cars of Delhi's roads. )

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sector. This not only accelerated awareness in the sector about energy efficiency, but also significantly supported decision-making by plant owners as well as a greater understanding of interventions by plant supervisors and workers. First, energy-efficient technology packages were provided to owners to inform them about technical

specifications and cost benefits of the intended technology. Second, a reference manual on energyefficient technologies and practices for profitable steel rolling was produced and disseminated to plant supervisors, informing them as well of details of technology packages and their benefits. Third, posters for workers and foremen informed them on the "do's and don'ts" of using the technology packages and energy-efficient measures.

In all, about 1,000 people from the steel units (owners, plant engineers, foremen) have been trained on energy efficiency measures. The project particularly increased the number of professionals in the smallscale steel sector with expertise in energy efficiency, from only 10

of Steel extended its financial support by providing an additional US\$300,000.

The project was further boosted by a three-tier approach to formulating knowledge products to propagate widespread replication of the technologies across the to nearly 100. It also has garnered numerous awards for its contribution to energy saving in the steel sector, including the 2014 India's Leading Energy Saving Expert Award from HITEC India, a non-profit organization that aims to promote IT solutions, next-generation networks and enabled services to the country.



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