Java Microservices Efficient energy management has been an important subject of research for a while now. It’s defined as the practices involved in minimizing and controlling the consumption of different types of energy.

Where efficient energy management brings significant local economic benefits[1], its environmental benefits span across multiple areas. Because of it incurring a win-win situation, both economically and environmentally, great emphasis is placed towards ensuring its implementation in multiple organizations worldwide.

One of the famous strategies to promote energy management via conservation is the Going Green Initiative[2]. While thousands of organizations may be were managing energy for a while because of its economic benefits, the recent push in ensuring the well-being of global environment has pushed them to consider increasing their efforts for environmental benefits as well.

This initiative makes it imperative for employees to take into account things that previously didn’t matter much. Things as small as turning-off switches before leaving your office, placing recycle bins with different partitions for different types of materials instead of simple dustbins and using electricity-efficient hardware etc. are all part of this movement and much more.

Other than the Go Green Initiative, people are encouraged to reflect on the phrase *charity begins at home* by actually making steps to trim-down unnecessary energy consumption. Steps as simple as reducing heating temperatures for geysers or planting trees around the house[3] can lead to immensely reduced utility bills and therefore, efficient energy management.

The recent advancements in technology have also played their part in helping organizations reduce their carbon prints. Where electric bulbs used to consume needless Watts of energy, the introduction of various green and efficiently developed hardware has breathed new life into energy management.

On a larger scale, grid systems that supply electricity to residential and commercial areas alike, are always overloaded due to the amount of load they’ve to cater for. To bring relief to them and to improve residential energy management, various efforts on Smart Home Energy Management Systems have been made to intelligently provide homes with energy that sits well with their everyday requirements[4]. These systems make use of Internet of Things (IoT) as well as intelligent Artificial Intelligence systems to provide energy as is required by homes.

Energy Mix has also been employed as a source to manage energy demands in a better, more sustainable manner. Energy Mix refers to using different sources of energy to meet overall demands. Where hydro power or thermal powered plants[5] has continued to be the backbone of energy demands, emphasis has tilted slightly towards other methods such as wind and solar.

The advantages of wind and solar energy are obvious from the environmental perspective. They’re as green as anything can be, are completely dependent on wind and sunlight and are a relatively lesser installation headache. Economically, they may not be the best as their overall output greatly depends on natural factors which is why, adoption of green strategies like these take a longer time to settle in.

Coming to Pakistan, we’re fortunate to have a country that sees the yearly 4 seasons in normality. Our country is blessed with all types of landscape as well as a 900km+ long coastline. This allows our country to employ multiple energy production systems ranging from dams to power plants to slowly and steadily creeping-in solar powered plants.

However, due to economic and political instability, Pakistan has always come-up short in its bid to explore its full potential. While slightly improved literacy and the growing integration of technology is leading to a gradual change, a lot of work leaves a lot to be desired, especially when it comes to topics such as sustainable energy management or anything related to the environment as a whole.

Organizations such as SMEDA or Small to Medium Enterprises Development Authority encourage using ISO compliant Energy Management Systems, conducting energy audits and training programmes[6] etc. on a national level to promote awareness is something of a silver lining.

However, more effort needs to be made at a global level for us to reap the true rewards of energy management. The future has to look greener than what it is today.

[1]<https://www.epa.gov/sites/production/files/2018-07/documents/mbg_2-5_economicbenefits.pdf>

[2]<https://www.swipedon.com/blog/green-workplace-initiatives>

[3]<https://www.energy.gov/energysaver/articles/how-much-can-you-really-save-energy-efficient-improvements>

[4]<https://www.researchgate.net/publication/260648084_Hardware_Design_of_Smart_Home_Energy_Management_System_With_Dynamic_Price_Response>

[5]<https://www.planete-energies.com/en/medias/close/about-energy-mix>

[6]<https://smeda.org/index.php?option=com_content&view=article&id=18&Itemid=120>