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# NATIONAL CONFERENCE

# INCLUSIVE CLEAN ENERGY SOLUTIONS IN ADB OPERATIONS

10-11 December 2024 • Chennai

**Project on IEEE Standards for Gender Equality and Social Inclusion**

*Reihana Mohideen, Chair IEEE-SSIT GESI Workstream*

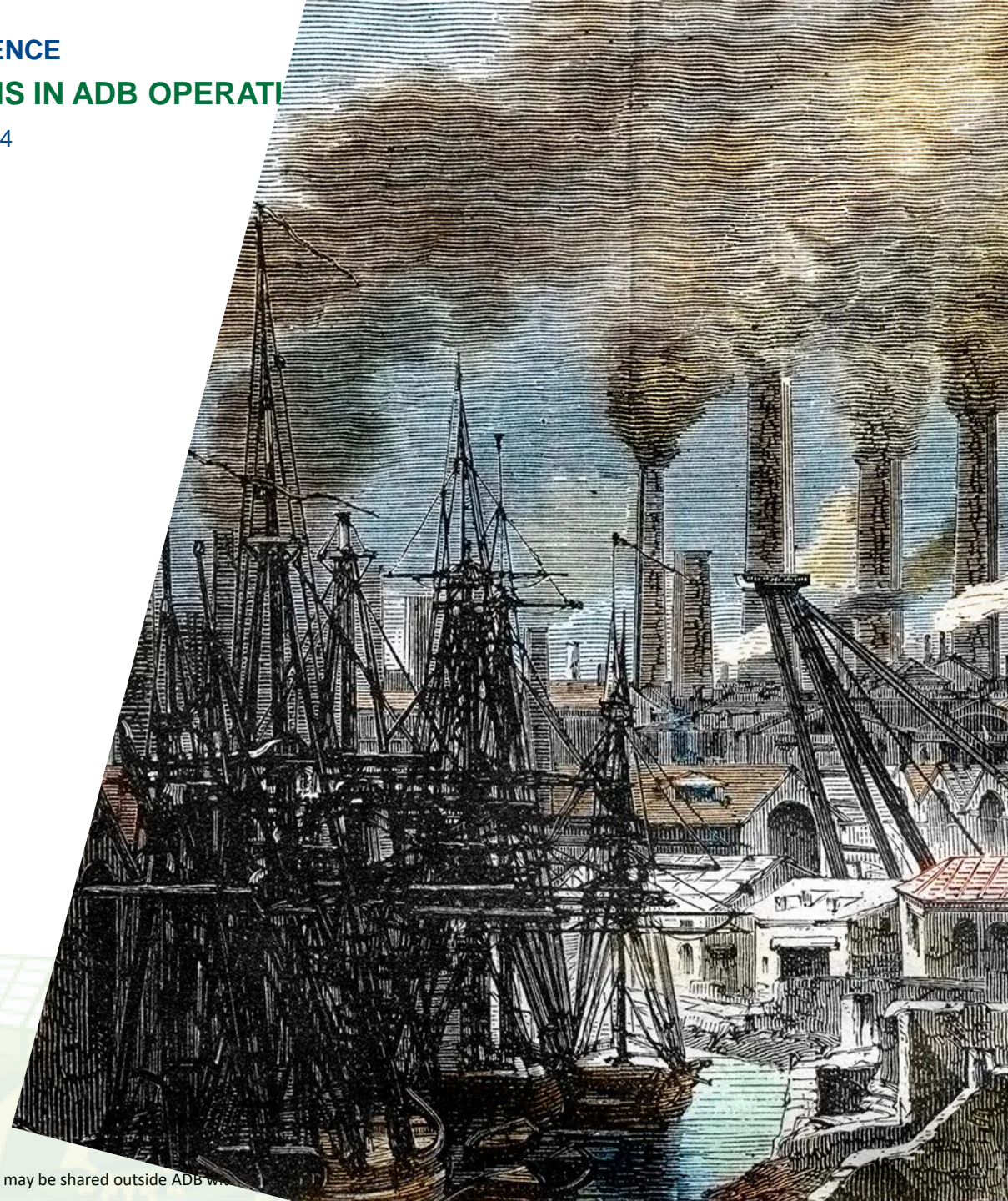




# NATIONAL CONFERENCE INCLUSIVE CLEAN ENERGY SOLUTIONS IN ADB OPERATIONS

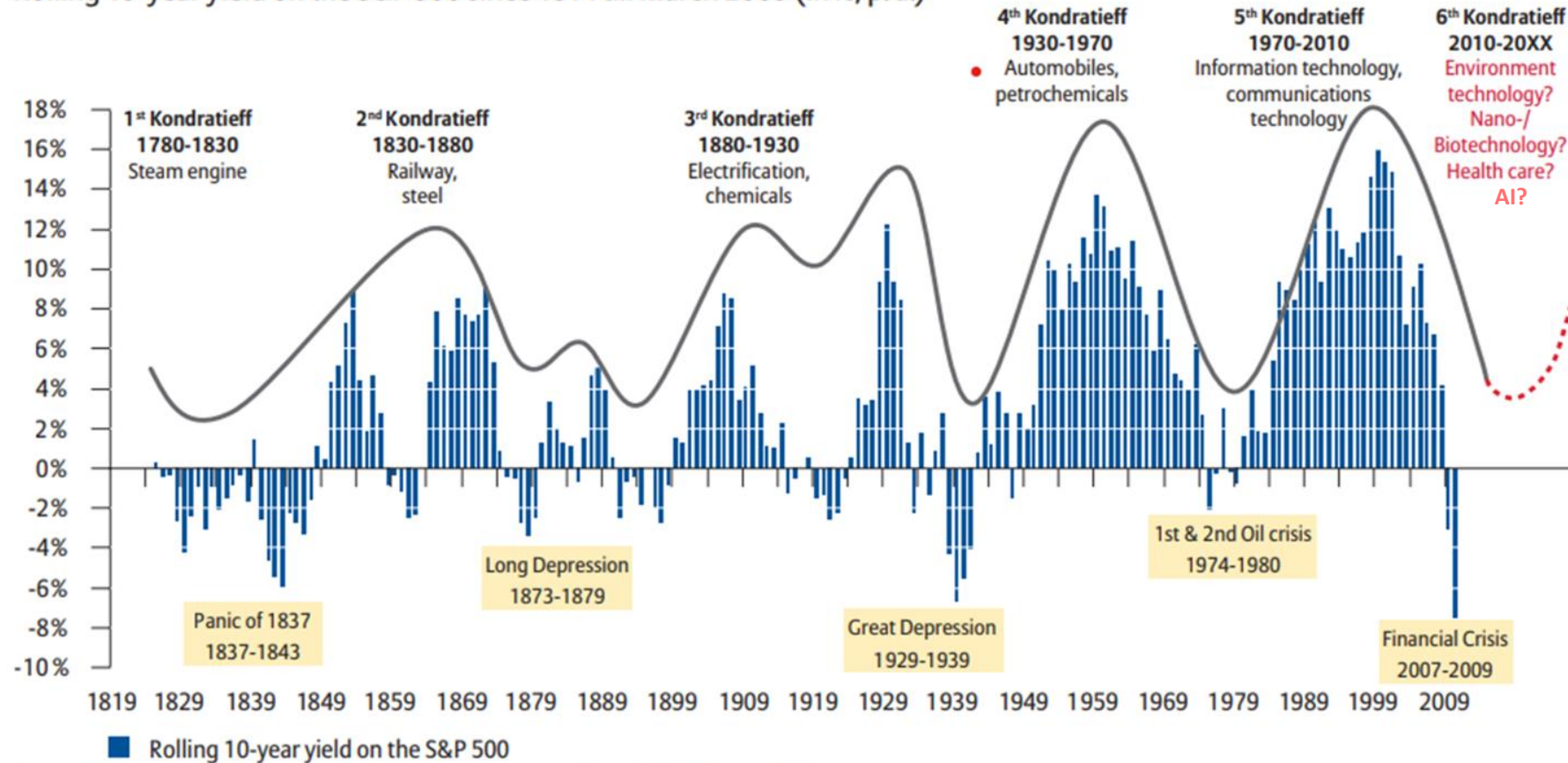
10-11 December 2024

## I. A Historical Perspective



# A Techno-Economic History

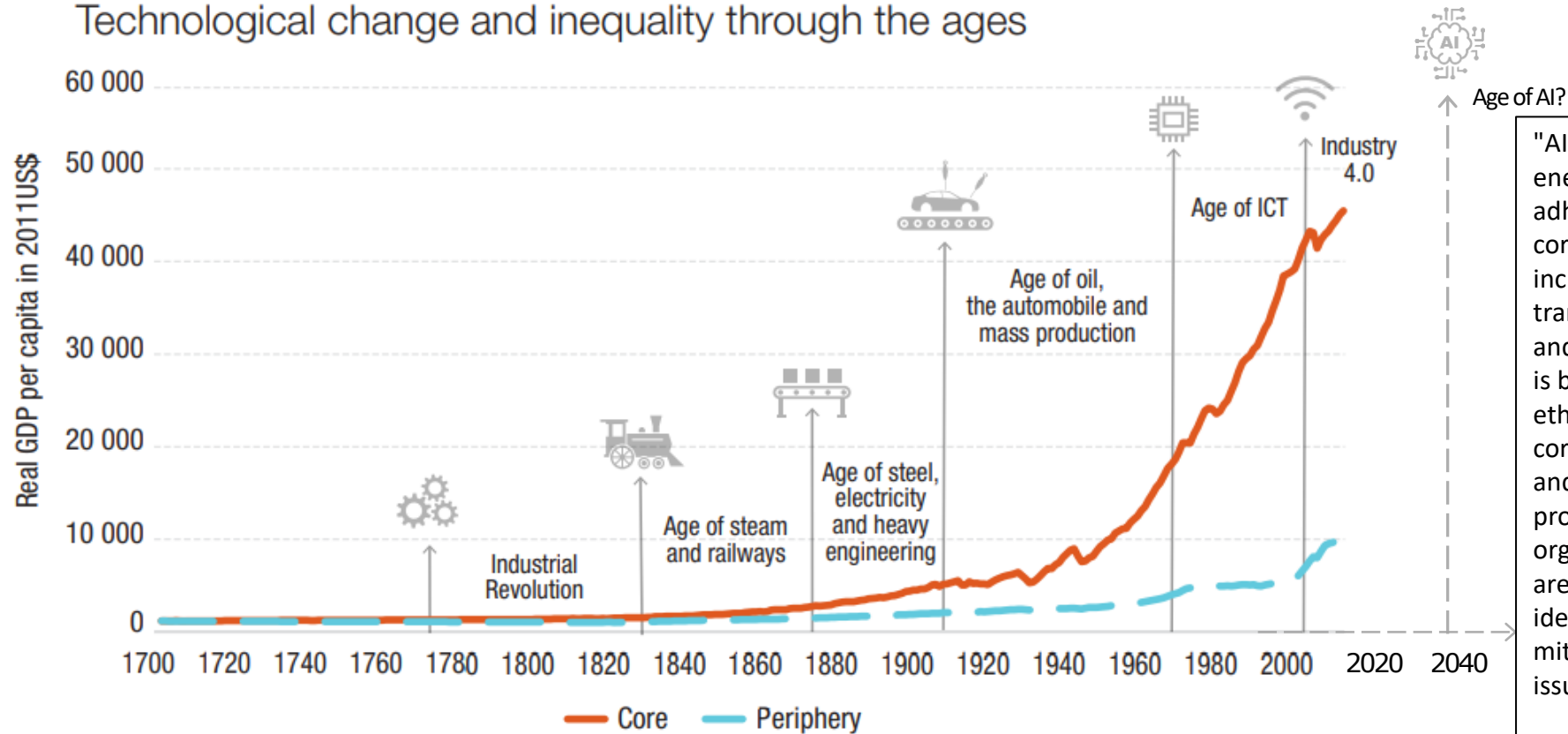
Figure 1: Kondratieff cycles – long waves of prosperity.  
 Rolling 10-year yield on the S&P 500 since 1814 till March 2009 (in %, p. a.)



Source: Datastream; Illustration: Allianz Global Investors Capital Market Analysis

# Benefits Unequally Distributed

Technological change and inequality through the ages



Global inequities have been increasing since the first industrial revolution.

"AI applications in the energy sector must adhere to the OECD's five core AI principles: inclusivity, fairness, transparency, robustness, and accountability. AI risk is best managed when ethical considerations are core to the technology and system design processes, ... and when organizational processes are designed for the rapid identification and mitigation of emerging issues."

**[World Economic Forum. "Harnessing Artificial Intelligence to Accelerate the Energy Transition." 2021.]**

Source: UNCTAD, based on data from Maddison Project Database, version 2018, Bolt et al. (2018), Perez (2002), and Schwab (2013).

Notes: "Core" corresponds to Western Europe and its offshoots (Australia, Canada, New Zealand and the United States) with Japan. "Periphery" corresponds to the world, excluding the "core" countries.



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## II. The IEEE-SSIT-SA Project on GESI Standards



# IEEE Standards Enabling Energy Transition

**IEEE SCC21  
1547 Series of  
Standards**

**IEEE Std 1547™ (2018) Standard for Interconnecting Distributed Resources with Electric Power Systems**

**IEEE Std P1547™ (full revision) Draft Standard** for Interconnection and **Interoperability** of Distributed **Energy Resources** with **Associated** Electric Power Systems **Interfaces**

**IEEE Std 1547.1™ (2005 and 2015 Amendment 1) Standard** for Conformance Tests Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

**IEEE Std P1547.1 (full revision) Draft Standard** for Conformance Tests Procedures for Equipment Interconnecting Distributed **Energy Resources** with Electric Power Systems **and Associated Interfaces**

**IEEE Std 1547.2™ (2008) Application Guide** for IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems

**IEEE Std 1547.3™ (2007) Guide** for Monitoring Information Exchange, and Control of Distributed Resources with Electric Power Systems

**IEEE Std 1547.4™ (2011) Guide** for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems

**IEEE Std 1547.6™ (2011) Recommended Practice** for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks

**IEEE Std 1547.7™ (2013) Guide** to Conducting Distribution Impact Studies for Distributed Resource Interconnection

**IEEE Std 1547.8™ Recommended Practice** for Establishing Methods and Procedures that Provide Supplemental Support for Implementation Strategies for Expanded Use of IEEE Std 1547-2003

MicroGrid >>

## GET Program for AI Ethics and Governance Standards

Supporting Global Trustworthy AI realization through human-centric Standards and AI Ethics Certification

### Well-Being

*“The continuous and sustainable physical, mental, and social flourishing of individuals, communities and populations where their economic needs are cared for within a thriving ecological environment”.*

### Metric domains

a) affect b) community, c) culture, d) education, e) economy, f) environment, g) human settlements, h) health, i) government, j) psychological well-being/mental well-being, k) satisfaction with life, and l) work.



**7010-2020 - IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being**



**7000-2021 - IEEE Standard Model Process for Addressing Ethical Concerns during System Design**



**IEEE SA - P7800** Recommended Practice for Addressing Sustainability, Environmental Stewardship and Climate Change Challenges in Professional Practice



**IEEE SA - P7803** Standard for Inclusive Sustainable Smart Cities Framework



**IEEE SA - P3469** Recommended Practice for an Environmental Liability Process Model for Accounting in Systems Engineering



**IEEE SA - P2882** Guide for Validation of Software Models of Generators for Power Systems Studies



**IEEE Power and Energy Society/Analytic Methods for Power Systems Standards Committee**

# There is a Need

- **Overcome barriers within the energy profession** (including social policy developers, engineers, etc.) in consideration and understanding of GESI factors in all aspects of the power and energy sector;
- **Improve GESI considerations for planning** the low-carbon energy transition;
- **Improve project governance** by including explicitly GESI factors in the decision-making in the Low Carbon Energy Industry;
- **Ensure that GESI considerations are an integral part of the operations and development** of local, regional, national, and international **power grids, trade, generation, transmission, and consumption.**
- **Provide tractable measures in support of the well-being of communities, societies, and individuals**, in terms of their health, work, family outcomes, productivity, education, governance, etc., and for vulnerable groups, for which the accessibility and affordability of quality energy services are both critical and essential necessities.



# The Gender Equality & Social Inclusion Workstream

‘To foster and advance technology to benefit humanity’

*The key elements that frame our concept of GESI in a technical context.*

- a. Technology, its development, and innovation should enable and not prevent GESI (unintended consequences). This requires that women and GESI communities are drawn into the processes by which technology is designed, developed, and used.**
- b. GESI communities should be able to afford and access appropriate technologies and should not be excluded from doing so because of their gender and social status.**
- c. An empowering environment should be created through policy, regulations, and standards-based solutions.**



# The Scope and Purpose of the Recommended Practice

The scope describes these requirements

- (1) How projects supporting the Low Carbon Energy transition can accommodate GESI considerations.
- (2) To address GESI considerations for both the transition phase as well as the business-as-usual phase after the transition phase has concluded.
- (3) How to monitor and to evaluate the effectiveness of GESI considerations in industry practices.
  - The requirements will be complemented with indicators and metrics to evaluate progress and outcomes.

**Purpose Statement: “This Recommended Practice will develop and encourage the application of industry standards within Power and Energy projects, for the Low Carbon Energy Industry, to advance diversity in the Engineering technical profession, and to promote an inclusive and equitable culture within society that welcomes gender equality and social inclusion with respect to public access of essential services such as electrical power.”**



# The Stakeholders

Stakeholders are by necessity wide-ranging as energy underpins modern society and will include

- **Industry**, development agencies, universities and tertiary institutions, and civil society organizations.
- **Social policy analysts and decision-makers** within the energy industry;
- **Government agencies** and departments that develop energy policies and provide social or financial support to vulnerable communities and individuals;
- **Representatives from communities - rural, Indigenous, vulnerable groups (low income especially women, people with disability, remote, young people, etc.), workforce in transition;**
- **Energy grid designers**, operators and managers, developers and governors;
- **Infrastructure designers** and deployers, and maintainers;
- **Insurance companies** and their underwriting partners in relation to risk assessment and consequences to the industry.



# The Stakeholders ...

- **Not-for-profits and charities** that support vulnerable communities;
- **Medical health monitors and device providers**, and their service providers;
- **Market operators** - energy resellers, retailers, utilities;
- **National and regional energy standards developers** to provide both representations for the development of this standard, and then thereafter use within the local environment (e.g. Standards Australia, etc.);
- **IEEE Societies and their Standards Committees** in the domain of power and energy generation, transmission, and use, or those societies that have an interest in GESI within their domain i.e. Power and Energy Society (PES), Consumer Technology Society (CTS);
- **Professional engineering bodies**, i.e. UN Council of Engineers for Energy Transition, Sustainable Energy for All, International Energy Agency



# The Five Outcomes

## 1. Access and Quality of Access

### Generation and Distribution Side Impacts

- Supporting the trend towards 'democratization' of energy production and consumption,
  - Automation and AI are potentially significant social-inclusion and data science focus areas.
  - Social, Economic and Gender Based Power Relations
  - User Knowledge and Understanding of New Technologies

## 2. Affordability

- Social Inclusion, especially for Low-Income Groups
  - Tariff levels, for example, generally do not consider women's lower incomes and public consultation processes are not always gender inclusive.
- Short-term Cost Increase, Planning and Mitigation
  - Clean energy subsidies tend to favor high-income more than low-income residents and access to energy efficiency measures often comes at a cost of personal investment that are often impossible to make for those on low incomes
  - Network Infrastructure Cost Planning, Including Off-Grid

# The Outcomes

## 3. Enabling policy environment

- Holistic GESI Policies that Consider Impacted Communities
- Social license to operate
- Incorporate local and Indigenous knowledge
  - To co-design context-specific systems, better catering to the needs of the users and will therefore be utilised by the users.
  - Social Protection to Mitigate Impacts Related to Job Losses

## 4. Develop the GESI Inclusive Workforce and Livelihoods (Micro, Small and Medium Enterprises)

- Addressing Gender Disparity in Employment and Wages in the Energy Sector
  - Women in science, technology, engineering, and mathematics (STEM) jobs in the energy sector are a minority.
  - A gender pay gap persists and is significant.
- Establishing Skills Development Programs to Create Livelihood (MSME) and Green and Decent Employment.

## 5. Metrics

- Measuring (Quantitative and Qualitative)
- Reporting and evaluating GESI impacts and outcomes, including uptake, affordability and access metrics, as well as workforce composition metrics.





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**This Project has been approved!  
The hard work begins now.  
We are seeking volunteers.  
See me or Pankaj Batra**

**THANK YOU!**

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