United Nations Conference on Trade and Development

8th GLOBAL COMMODITIES FORUM

23-24 April 2018, Geneva

Building skills to support Argentina’s mining sector

By

Horacio Jurado, Director of Mineral Value Chain, Ministry of Energy and Mining, Argentina

The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.
Building skills to support Argentina’s mining sector
Argentina, some facts

World class science and technology institutes:
- Consejo Nacional de Investigaciones Científica y Técnicas (CONICET)
- Instituto Nacional de Tecnología Industrial (INTI)
- Instituto de Tecnología Minera (INTEMIN)
- Servicio Geológico Minero Argentino (SEGEMAR)

Source: inversionycomercio.org.ar
Argentina Mining sector at a glance

### Copper
- 20th world producer of copper and 5th in Latin America, having a production potential eight times higher than the present one, which would place it 6th in the world ranking.
- 10th world producer of silver and 5th in Latin America, with the potential to be one of the world's top five
  - 10 Advanced projects

### Gold
- 13th world producer of gold and 4th in Latin America, having the potential to stand amongst the ten most relevant gold producers on a global scale
  - 8 Operating mines
  - 2 mines under construction
  - 10 projects from advanced exploration to feasibility
  - 17 intermediate exploration projects
  - 181 projects in early-stage exploration phase.

### Lithium
- Lithium in 23 salars
- 4th largest lithium reserve in the world. Current production ranks the country 3rd on a global level and 2nd in the region.
  - 2 Operating mines both expanding productive capacity
  - 2 mines under Construction
  - 10 projects from Feasibility to Advanced Exploration
  - 40 projects in Early-Stage exploration phase.
  - 6 Exploration prospects in pegmatites

Source: Subsecretaría de Desarrollo Minero
Global Mining Megatrends

Thinking the Future, Now

Skills Development Strategies

Linkage between Universities, Government, Unions and Mining Companies
The Innovation imperative
A drop in commodity prices, and rising costs, declining ore grades and concerns about decreasing productivity are compelling the mining industry to focus on operational costs.

The Era of Accountability
Mining companies will move forward as good corporate citizens, where accountability and environmental success exceeds expectations, strengthening community engagement and support for existing and new projects into the future.

Plugged in, Switched on
Digital technologies, data analytics and automation along with greater mobility and increasing connectivity are creating exciting opportunities for the mining industry.

Rethinking Our Reserves
Rates of discovery for high-quality and accessible ores are declining and not keeping up with depletion. Solutions that help exploration under cover, extend the life of a mine and optimise recovery.

New supply, New Demand
Increasing urbanization and rapid development of emerging economies will continue to spur demand for mineral resources, which will be supplied from developing nations and new geographic domains through technology advancements.

The Knowledge Economy
As emerging economies continue to develop their mining sectors, support in developing applicable skills, services and technologies will be required for efficient and sustainable exploitation of mineral reserves.

Source: CSIRO.
• Structured and equipment based training pathway from new equipment through to operator training.

• 24/7 and 52 weeks a year running operations implies flexible timing for training

• Key operators and trainers train other operators, and the equipment becomes embedded into ongoing operations.

• Moving on to more complex roles and pieces of equipment, means better salary or improved job conditions.

• Training on site (often in remote locations).

• Teamwork

• Autonomous maintenance

• Environmental issues

• Automation

• Health & Safety:
  ▪ Nutrition
  ▪ Diseases prevention
Modular component design
  Plug and play maintenance

Less people in the field/ On site
  - Remote monitoring and control
  - Health and Safety
  - Cost
  - Multi skilled roles
  - Less environmental impacts

Technical support equipment
  - Intelligent equipment
    - Remote and real time diagnosis
  - Interoperability
    - Augmented reality
    - Drones
    - Uses of Apps
    - Internet of things
    - Big data

It is necessary to provide very specific and focused training about mining equipment

- Electronics
- Automation
- Robotics
- Mechatronics
- Electromechanics
- Hydraulics
- Pneumatics

Mantainers capable of:

- Operate and Repair equipment that repair equipment
- Think in modules than in spare parts
- Maintain equipment off site
In the past, the whole process was to finding the resource, developing the mine, extracting the metals—and then starting the process all over again.

Managers were concerned about technical aspects of the job and to get the ore out of the ground as quickly as possible.

Managers have simply grown through years of experience “on the job.”

Production, production, production…bonus!!!

- Adapt to a leadership gap at companies that are advancing technical specialists who may be lacking in the strategic and leadership qualities necessary to lead project development and operations in challenging locations.
- A shrinking pool of key technical talent throughout the industry.
- The social, environmental and regulatory dimensions of operating large-scale mining operations.
- The health and safety issues associated with those operations.
- The need to balance short-term results vs. taking a long-term view of the business.

Skilled managers for a new kind of business...
Skills Development Ecosystem

- Link with Universities for Young talent pool
- EIT & Internship programs
- Sharing developments in technology or new processes
- Create long term relationship
- Toward Sustainable Mining (TMS Program)

- Specific training for equipment operators (certification)
- Operator development linked with knowledge and safety performance

- R+D according with mining needs
- Design of specific training programs for technicians and maintainers

- Updating policies to fostering skills development
- High school finishing programs for operators
- Tax incentives for training & development projects
- COFEMIN (Consejo Federal Minero)