



OECD Mining Regions: building a network to enhance productivity and well-being

5th and 6th October 2017
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Chilean Copper Productive Diversification: What are the Issues?

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Short Chilean Cu History

XX Century: Chilean Cu Production: 16% Y*

Chilean Society View of Cu: Milking Cow => US\$ (B.P.) & \$ (F. Budget)

XXI Century: Chilean Cu Production: 30% Y*

Innovation is a key factor in the XXI

Third role for Cu (in addition to being a milky cow)

Can Chile use Cu as a platform to generate Innovation?

Cu – Plataform to Generate Innovation

1 – Transfer & Dissemination Modern Technology

- Cu uses TECN + => Automatization – remote control – robotización – genomics – satellite & GPS -- sensors
- How does Chile benefits from the \exists of Modern Technology in Cu mining?
How can Modern Technology be disseminated to the rest of productive sectors?
- Regional Universities have a key role on developing courses on Modern TECN
Mining Companies professionals should be invited to give Workshops
on Modern TECN

2 – Cu Cluster

Why a Cu Cluster? – To link Cu production to local producers

Cluster => Mechanism to generate Cu productive diversification

Key Issue: **How do local communities & local Regions benefit by Cu production located in their geographical site?**

Generation Backward Productive Linkages (Australian model) =>
produced World Class Mining Supplier Firms

Goal: Transform local firm suppliers into competitive exporters

Looks like a good idea --- what are the bottlenecks?

a) There are 4.500 firm suppliers – but only 3% have HK & TECN capability

b) Chilean mining Company professionals are pro-statu quo:

there is a biased preference for foreign suppliers -- Why?

How could a Chilean firm produce a better product than a foreign firm?

3 - Insertion in Global Value Chains (GVC)

Annual Cu Mining Imports:

- Machinery: US\$500M (50% trucks)
- Parts & spares: US\$536M -- Tires: US\$123M
- Machinery maintenance services: US\$1.700M
- Chilean equipment market imports related to mining is US\$3.000M/year:

If 30% Y^*_{Cu} & 30% R^*_{Cu} are here then

Why Chilean value added in world Cu mining machinery is almost zero?

Why Chilean share on world R&D in Cu innovation is almost zero?

How come that in 25 years of a sharp \uparrow Chilean Cu expansión --
Chile has not been able to participate in a machinery mining GVC?

Comparative Advantage

- **Does Chile have Comparative Advantage to produce Mining Equipment or equipment parts & spares or machinery maintenance services?**
- **Did Japan had Comparative Advantage to produce cars in 1950?**
- **Did South Korea had Comparative Advantage to produce cel phones in 1987?**
- **Did China had Comparative Advantage to produce high speed trains in 2005?**
- **No – but these countries developed Dynamic Comparative Advantage**
- **It is time for Chile to do the same w/r to parts & spares -- machinery maintenance services – and eventually mining equipment**

The New Role for Mining

Comparative Advantage factors for Cu as a platform for technological innovation:

- Activities have local specificity req. (water – energy – mineral characteristics)**
- New productive requirements: Environment & Social License**
- Necessity to adapt productive techniques → focus on suppliers innovation ability**

Mining is the only Chilean sector with a large size to generate projects with a high r^*

∃ coincidence between Public/Private goals to put Cu in the center of the development strategy for the next 10 to 20 years

**To produce TECN transfer & know how acumulation–
it is required learning & training by local HK**

SOCIAL LICENSE

- **How to acquire the Social License?**
- **∃ Social Capital is a necessary condition to address the Social License problem**
- **Mining is a sector that has developed Social Capital – last 8 years:**
 - (i) PPCM (2008) – (ii) Mining Labor Competence Council – (iii) CESCO -Minnovex**
 - (iv) President Lagos Committee -- (iv) Alta Ley & Valor Minero –**
 - (v) Road Map for Technological Challenges – 2015-2035**
 - (vi) Open Innovation Mining Platform (FCH - Expande Program)**
- **There is no other productive sector having the social capital that mining has developed**
However: ∃ paralyzed Investment projects – Large delays in environmental approvals
– There still exist homework to be done

Large Mining Companies (LMC)

- **LMC should become the Chilean Innovation engine – What Incentives would they have?**
 - i – Mining is a LR activity – LM companies will be here next 30-50 years**
 - ii – Future Cu production faces many different complex technological challenges**
 - iii -- Chile has 30% world Cu Reserves**
 - iv – Cu is a multiuse material – There will exist ↑ demand (electric cars)**
- **Role OIMP => bias young preferences from developing Super Google to Mining IT apps**
Goal : Transform Chilean mining into a close substitute of Silicon Valley
- **Mining Companies have to have a commanding role towards domestic innovation**
-- VicePresident Innovation should have a similar level to the VicePresident Finance --

What are the Issues?

- **Can Chile use Cu as a platform to generate Innovation?**
- **How do local communities & local Regions benefit by
Cu production located in their geographical site?**
- **If 30% Y^*_{Cu} & 30% R^*_{Cu} are here then -- let us develop Chilean Dynamic Comparative Advantage to produce Mining Equipment - parts & spares
– machinery maintenance services**
- **How to acquire the Social License? – Social Capital is a necessary but not a sufficient Condition**
- **Large Mining Companies have to become the Chilean Innovation engine**



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