

GIOVANNI NIGRIS
EXECUTIVE VICE PRESIDENT
DANIELI GROUP

46TH FARO MEETING
KILOMETRO ROSSO
BERGAMO
19 OCTOBER 2016



F·A·R·O

EXCELLENT PERSPECTIVES FOR THE IRANIAN METALS INDUSTRY



DANIELI / SINCE 1914
PASSION TO INNOVATE
AND PERFORM
IN THE METALS INDUSTRY



DANIELI TEAM
A CENTURY
OF PARTNERSHIP
EXPERIENCE

- 1 **WORLD METALS
OUTLOOK**
- 2 **METALS PRODUCTION
IN IRAN:
KEYS OF SUCCESS**
- 3 **EXPANSION PLANS
OF THE IRANIAN
METAL INDUSTRY**
- 4 **TECHNOLOGIES
TO COMPETE WITH**
- 5 **DANIELI IN IRAN
- REFERENCES
- MANUFACTURING AND SERVICE CENTER**
- 6 **CONCLUSIONS**

WORLD METALS OUTLOOK

The global population is expected to reach 9 billions in 2040.

This means that steel demand will increase to 2.1 billion tonnes (approx. 2,5%).

Finished steel	Tonnage, Mt			ASU/cap, kg		
	2014	2020	2040	2014	2020	2040
World	1537	1663	2101	212	215	232
NAFTA	145	158	195	300	312	337
L. America	48	53	64	101	105	111
EU28	147	161	168	288	313	325
Other Europe	37	41	46	340	359	367
CIS	57	58	82	217	223	335
MENA	52	62	87	225	243	267
Africa	37	50	107	33	39	54
Asia	1008	1072	1343	261	264	303
Developed Asia	146	148	120	706	716	606
Developing Asia	862	923	1223	236	240	289

Regions	Mt			y-o-y growth rates, %		
	2014	2015	2016 (f)	2014	2015	2016 (f)
World	1539.9	1513.4	1523.4	0.7	-1.7	0.7
Developed Economies	413.0	404.2	411.6	6.4	-2.1	1.8
Emerging and Dev. Economies	1126.9	1109.2	1111.8	-1.2	-1.6	0.2
China	710.8	685.9	672.2	-3.3	-3.5	-2.0
MENA	70.1	73.3	77.2	5.7	4.6	5.2
Em. and Dev. Economies excl. China	416.1	423.3	439.6	-2.6	1.7	3.8
World excl. China	829.1	827.5	851.3	4.5	-0.2	2.9

The global population is expected to reach 9 billions in 2040.

This means that aluminium worldwide production will increase average to 4% per year.

	Global AI production	2015	2016	2017	2018	2019	2020
Africa		1,670	1,675	1,678	1,684	1,690	1,700
North America		4,448	4,108	4,083	4,083	4,100	4,230
Latin America		1,319	1,281	1,315	1,543	1,582	1,594
Asia (ex. China)		3,725	4,276	4,513	5,475	5,724	5,903
Western Europe		3,389	3,401	3,425	3,425	3,442	3,480
Eastern/Central Europe		4,285	4,450	4,631	4,919	5,124	5,332
Australasia		1,969	1,972	1,972	1,972	1,975	1,980
China		31,429	34,250	36,521	36,821	38,101	39,855
MENA		5,105	5,207	5,327	5,527	5,705	5,913
Total		57,343	60,643	63,365	65,463	67,443	69,987
Year on year % change		7.8%	5.8%	4.5%	3.3%	2,9%	3,6%

The global population is expected to reach 9 billions in 2040.

This means that aluminium worldwide demand will increase Approx. to 5% per year.

Consumption	2015	2016	2017	2018	2019	2020
North America	6,128	6,368	6,577	6,709	7,015	7,455
Latin America	1,868	1,915	2,015	2,093	2,204	2,454
Asia (ex. China)	10,054	10,576	11,127	11,698	12,267	12,922
Western Europe	6,562	6,788	6,979	7,118	7,338	7,655
China	29,457	31,725	33,946	36,017	38,750	40,335
Others	3,006	3,051	3,138	3,250	3,505	3,815
Total	57,075	60,423	63,780	66,885	71,079	74,636
Year on year % change	5.4%	5.9%	5.6%	4.9%	5,9%	4,8%

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METALS PRODUCTION IN IRAN: KEYS OF SUCCESS

WHY

- ✓ **Broad domestic industrial base**
- ✓ **Educated and motivated workforce**
- ✓ **Young population (60% < 30 years)**
- ✓ **Cheap labor cost (~300-500 \$/month)**
- ✓ **Cheap energy (~1,5 Cent\$/kWh)**
- ✓ **Geographical location: access to Caspian, Persian Gulf and Eastern country's markets**
- ✓ **GDP actual 3%, approx. 40% industry, 50% services**
- ✓ **Industry and services annual average growth of 10%**

Commodity	Production 000 tonnes	Ranking
Steel	16,500	14 th
Aluminium	350	17 th
Copper	200	20 th
Cement	70,000	4 th
Passenger Car	1,000,000 (units)	18 th
Commodity	Reserves	Ranking
Crude Oil	157 billion bbl	4 th
Natural Gas	34 tcm	2 nd

- Mineral resources
- Iron Ore

+

Gas

=

10° producer
of the world
Global
Minerals

Iranian
metals
downstream
potential hub

Bauxite 1 Billion Ton
Alumina 0,5 Billion Ton
Iron Ore 3 Billion Ton
Copper 2,5 Billion Ton
Lead & Zinc 50 Mio Ton
Gold 250.000 Ton

**Natural gas
Availability
at low cost
~3 cent\$/m³**

Sustainability
Save of CO2
Recycable
Green metal

	Area [km ²]	Density [persons/km ²]
Iran	1.648.000	48
Italy	301.338	200
Iran/Italy	~5,5 times	~One fourth

IRAN

-15%

CHINA

IRAN

-25/30%

EUROPE

IRAN

-25/30%

USA

CHEAP GAS PRICE, ELECTRICITY PRICE, LABOR COST

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EXPANSION PLANS OF THE IRANIAN METAL INDUSTRY

Commodity	Production tons (1,000)	
	2015	2025
Steel	16,500	55,000
Aluminium	350	1,500
		5,000 (under study)
Copper	200	700
Cement	75,000	94,000
Passenger cars	1,000,000 (units)	3,000,000 (units)

- Population: 80 Millions
- Very low consumption Per-Capita
- GDP forecast 5%

- ✓ Specialty steel grades for automotive (SBQ)
- ✓ Rails, medium and heavy sections
- ✓ Seamless pipes and premium connections
- ✓ Extruded stainless steel pipes
- ✓ Cold strip processing lines for automotive
- ✓ Cold strip processing lines for food industry (tin plate)



PRIORITY

- ✓ Pharmaceutical packaging
- ✓ Wrinkle wall containers
- ✓ Laminated products
- ✓ Lithographic Sheet
- ✓ Beverage Can
- ✓ Food packaging
- ✓ Painted sheet
- ✓ Heat Exchangers



POTENTIAL

- ✓ Automotive

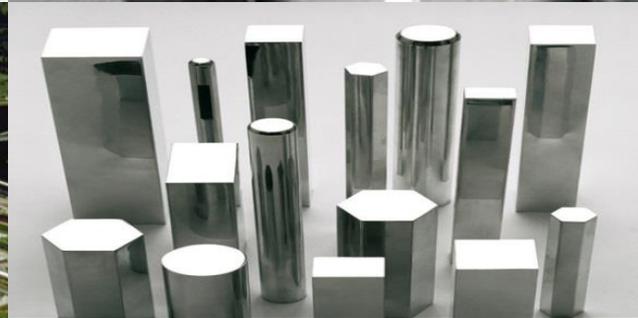


FUTURE

- ✓ Passenger aircraft



**HIGH TECHNOLOGY
FOR HARD AND SPECIAL
ALUMINIUM ALLOYS**





Air Conditioning



Fuel Gas
(Natural Gas and L. P.)
Distribution



Solar



Refrigeration



Fire Sprinklers



Irrigation
and Agricultural
Sprinkler Systems



Direct Exchange
Geothermal
Heating/Cooling



Medical gases



Snow melting



Domestic Water
Service
and Distribution
Floor Heating Systems



Drain, Waste and Vent



Sanitary and Drinking
Water

Application	Thickness range [mm]	Remarks
Roofing, gutters	0.5 ~ 0.7	
Cables	0.2 ~ 0.4	Radio frequency & submarine
	0.025 ~ 0.1	Cable wrap
Connectors, Lead frames	0.1 ~ 3.0	may be tin-coated material as well
Foils	0.006 ~ 0.1	For printed circuit boards, lithium batteries & solar strip
Coins	1.5 ~ 2.3	May be clad as well
Transformer strip	0.3 ~ 3	
Heat exchanger strip	0.025 ~ 0.5	
Commutator strip	1 ~ 4	



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TECHNOLOGIES TO COMPETE WITH

BENCHMARK RESULTS

DRI average properties

Metallization	94.6%
%C	2.3%
EAF inlet T	500° C



Daily average values

	Cold DRI	90% Hot DRI
Yield	87.7%	87.8%
Tap to tap	53 min	43 min
Power-on	45 min	36 min
Avg. power	108 MW	107 MW
Electric Energy	528 kWh/t	420 kWh/t
Oxygen	33 Nm3/t	31 Nm3/t



TECHNOLOGIES
TO COMPETE WITH

MAJOR TECHNICAL INNOVATIONS TO SUPPORT THE API X70/80
STEEL GRADES FOR AUTOMOTIVE AND PIPES APPLICATIONS

DANIELI



TECHNOLOGIES
TO COMPETE WITH

MAJOR TECHNICAL INNOVATIONS TO SUPPORT THE RAIL AND PROFILE NEW POTENTIAL MARKET

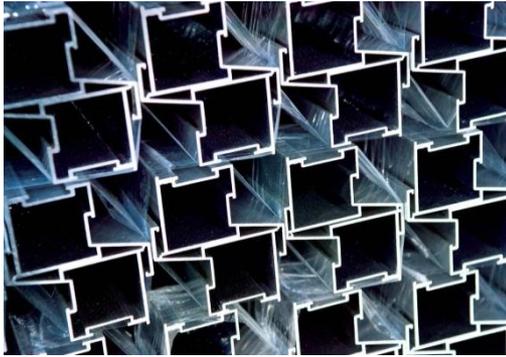
DANIELI



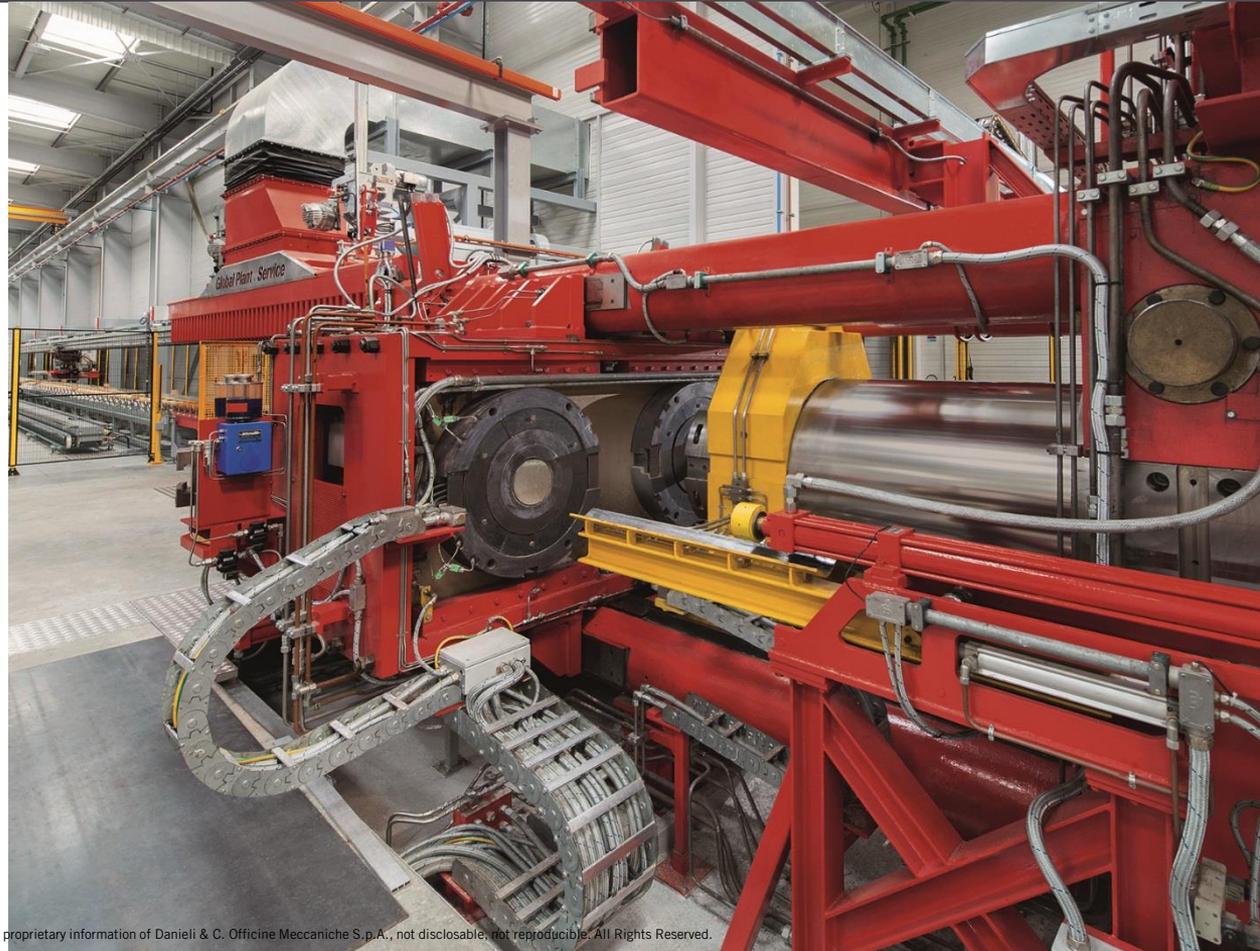


Aluminium strip produced with the innovative Alcoa Danieli Micromill process which offers improved mechanical characteristics: see possible production of 7xxx alloys to compete with steel.





**Energy saving with the
new ESED Electrical Drive
which guarantee up to
40% power saving
Reduced dead cycle time
saving up to 40% installed
power by the exclusive
T-win press.**





**Endless aluminium and copper
hard-alloy rod production;
less than 3 hours from
ingot to finished coil
with 3 operators**



SEAMLESS

- > 16" HRM and Finishing Lines



COPPER PIPES



WELDED

- > 2 3/8 - 7" ERW and Finishing Lines
- > 4 1/2 - 5 1/2" ERW and Finishing Lines
- > 20 - 56" LSAW Line and Coating Plant
- > 20 - 120" HSAW and Finishing Lines



FINISHING LINES

- > 2 3/8" - 13 3/8" OCTG Finishing Line
(Premium Connection included)





Extrusion Press



**Run-Out Table
double length**



Cooling Tunnel



Double Pullers



Cooling Bench



Profile Stretcher



Layer forming belts



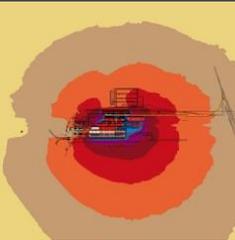
Cut-to-length Saw



Automatic Stacker



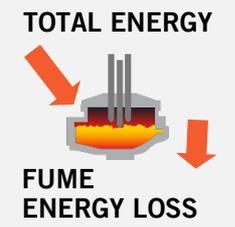
Ageing Furnace



NOISE
Noise Control Indoor and
outdoor



AIR POLLUTION
Fume treatment plants



ENERGY LOST CHR™
Clean Heat Recovery from EAF
hot fumes into electric energy
by Exergy ORC Turbine



EAF DUST INDUTECH®
Process and Recover of ZnO



**EAF – BOF – LADLE SLAG
ECOGRAVEL®**
Process Recovery System



BOF GAS CLEANING PLANT



**LADLE SLAG AND
REFRACTORY BRICKS**
Synthetic DoloLime production



INNOVAL
Environmental friendly support
to product and process
development

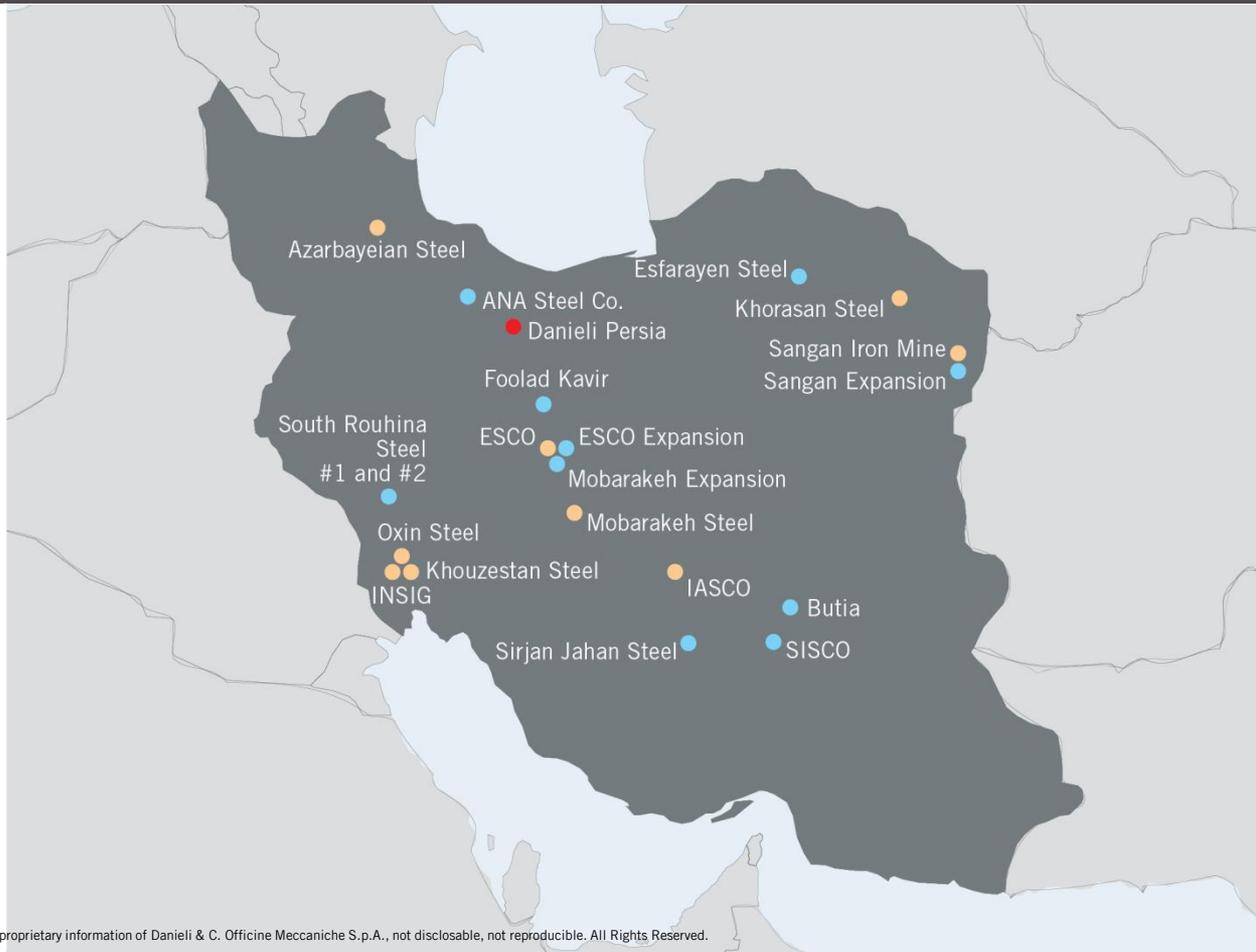
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DANIELI IN IRAN

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SERVICE CENTER

- Danieli plants in operation
- Danieli plants under construction
- Danieli Persia workshop

- ✓ **Population: 80 Millions**
- ✓ **Area: 5,5 times Italy**



KHOUZESTAN OXIN STEEL COMPLEX

Compact plant for wide plates



IASCO IRAN ALLOY STEEL CO.

“The Diamond in the Desert”



SANGAN IRON ORE MINE PROJECT

Mining, concentration and pelletizing facilities



INSIG IRANIAN NATIONAL STEEL INDUSTRY GROUP

High-flexibility bar rolling mill



MOBARAKEH STEEL CO. - SABA PROJECT

Minimill for hot rolled coils



AZARBAYEJAN STEEL COMPLEX

550,000-tpy high-flexibility bar mill



MOBARAKEH STEEL CO.

200,000-tpy tin plate cold mill complex



PHASE 1:

MACHINING: 4.600 SQM
ASSEMBLY (H+L): 3.900 SQM
WAREHOUSE & AUX: 2.500 SQM
FACTORY MISC: 5.000 SQM
TOT COVERED AREA: 16.000 SQM

PHASE 2:

DOUBLE CAPACITY



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CONCLUSIONS

<p>STEEL</p>	<p>55 Mtpy by year 2025: the expansion plan for the Iranian steel industry.</p>	<p>Iran high competitiveness: iron ore and natural gas availability at low costs.</p>	<p>Persian Metallics: JV for the construction and operation of an iron ore treating complex.</p>	<p>Danieli support to the Iranian steel industry: 15 steel plants supplied since 1980.</p>	<p>Danieli Persia manufacturing and service center: in operation by January 2017.</p>
<p>ALUMINIUM</p>	<p>1,5 Mtpy by year 2025: the expansion plan for the Iranian industry.</p>	<p>Iran high competitiveness: energy and natural gas availability at low costs.</p>	<p>Join Venture for the construction and operation of an Aluminium complex.</p>	<p>Danieli support to the Iranian aluminium industry and steel plants supplied since 1980.</p>	<p>Danieli Persia manufacturing and service center: in operation by January 2017.</p>
<p>COPPER</p>	<p>700.000 tpy by year 2025: the expansion plan for the Iranian industry.</p>	<p>Iran high competitiveness: copper mines available, energy and natural gas availability at low costs.</p>	<p>Join Venture for the construction and operation of a Copper complex.</p>	<p>Danieli support to the Iranian copper industry and steel plants supplied since 1980.</p>	<p>Danieli Persia manufacturing and service center: in operation by January 2017.</p>

QUESTION

IRAN



New **COMPETITOR** on the market?
or
New Business **OPPORTUNITY?**

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THANK YOU FOR YOUR ATTENTION



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