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**INTEGRATED PLANTS & SOLUTIONS**  
FULLY OPTIMIZED AND  
INTEGRATED TECHNOLOGY  
FROM A SINGLE SOURCE

# PRIMETALS TECHNOLOGIES

## WORLD-CLASS PORTFOLIO

Primetals Technologies is a worldwide leading engineering, plant-building and lifecycle partner for the metals industry. The company offers a complete technology, product and service portfolio that includes integrated electrics, automation and environmental solutions. Every step of the iron and steel production chain is covered - from raw materials to the finished product - in addition to the latest rolling solutions for the nonferrous metals sector.

On the basis of the experience acquired from the successful completion of thousands of projects for the metals industry, Primetals Technologies provides advanced and optimized solutions for integrated steelworks and minimills, for new and existing plants, and for all auxiliary facilities. Our integrated portfolio comprises mechanical equipment and mechatronic systems, electrics and automation as well as utility supply and environmental technologies.

Primetals Technologies manufactures much of the core components used in its plant machinery at its own state-of-the-art factories and workshops. This ensures that the machines and systems we supply meet the highest standards with respect to workmanship, reliability and durability.

Primetals Technologies has unrivaled experience in the upgrading of metallurgical plants.

Our goal is to ensure that machines and equipment operate at peak performance and cost efficiently throughout their entire lifetime. Through the installation of innovative technology packages and process-optimization systems, we create long-term value for our customers.

Major improvements in productivity, quality, flexibility and safety are proof of the added value we provide.

### PROFIT FROM OUR EXPERIENCE

Primetals Technologies is dedicated to creating sustainable value for its customers and for society. This is accomplished on the basis of combined innovative power and extensive experience in metallurgical processes. Plant projects are implemented in close cooperation with producers in an effort to achieve win-win results and to foster long-term partnerships.

### DECISIVE BENEFITS

- Comprehensive technology and product portfolio for totally optimized and integrated processes along the entire metals value chain
- Engineering excellence as the basis for perfectly designed and cost-efficient plants and equipment
- Wealth of experience in fast project completion, plant start-ups and design
- In-house manufacturing to ensure highest-quality workmanship of supplied equipment and components
- Global company network to provide immediate support and a fast response to all customer inquiries
- Strong financial backbone supported by joint-venture partner companies and shareholders
- Proven track record of fully meeting all project specifications and customer requirements
- All-inclusive lifecycle services to ensure prime-quality products and peak performance throughout a plant's lifetime
- Combined innovation power to master the challenges of today and tomorrow

# WORLD-CLASS INTEGRATED PLANTS & SOLUTIONS

## EXPERIENCE THAT MATTERS

Primetals Technologies is your reliable partner for integrated solutions. We have over 60 years of worldwide experience in the development and implementation of projects for the metallurgical industry. Single-point responsibility and close collaboration with all technological departments within Primetals Technologies ensures that plants can be developed and implemented fully in line with individual requirements. In the process, interfaces are optimized. Primetals Technologies leverages its experience and expertise to help plant operators succeed right from the start, as impressively proven in numerous successful projects in more than 100 countries around the world.

## SUSTAINABLE SOLUTIONS FOR THE ENTIRE PLANT

We build complete plants of any size, from “small” to “mega” and deliver plant components as well as integrated solutions, including modernization and revamping. Our plants are designed to precisely meet production targets and requirements, irrespective of geographic, geological and climatic factors.

Primetals Technologies’ broad wealth of experience makes it possible to offer solutions for the entire value-added chain, which means individual solutions can be optimally coordinated.

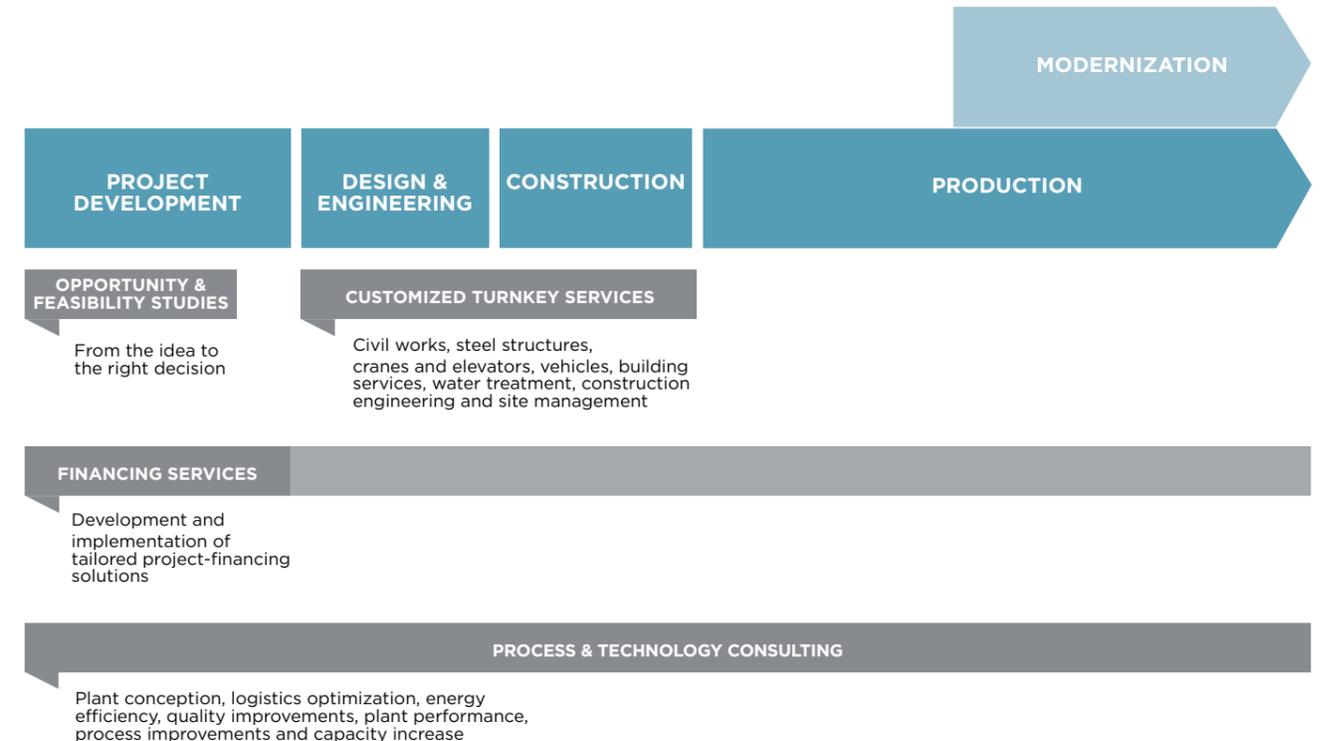
## YOU EXPECT

You want to succeed in a global market with expert, integrated solutions from a single source. To help you do so, we offer:

- Expertise in plant building thanks to worldwide experience
- Efficient project management and implementation of integrated solution projects combined with unique expertise in engineering and construction management
- Minimum costs and time for project implementation through close coordination of the different work phases
- Well-designed solutions for increased energy efficiency, environmental protection, and optimized and efficient production processes

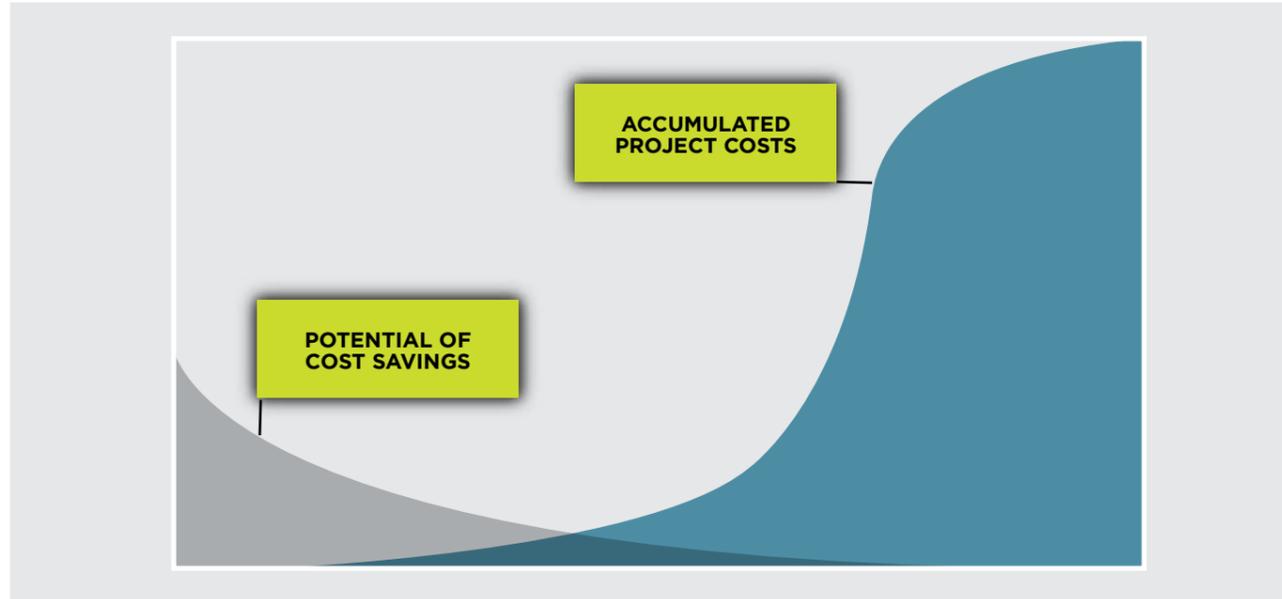
## GOOD REASONS TO CHOOSE PRIMETALS TECHNOLOGIES’ INTEGRATED SOLUTION EXPERTISE

- Seamless process management backed by sustainable and innovative technologies. Our process know-how leads to a design that thoroughly reflects the specific requirements of your production facility, while maximizing energy efficiency and minimizing financial impacts
- International experience proven by metallurgical solutions implemented in more than 1,800 projects worldwide. Our top health and safety standards are a key priority in international business
- Optimized efficiency in project implementation and plant start-up. Our focus is on the profitability of your plant and optimally managed interfaces throughout the entire lifecycle
- Expert support for large investments in the metallurgical business. Our project managers ensure that you have a reliable partner for planning and implementation so that your projects can be completed successfully in the minimum time possible



# PROJECT DEVELOPMENT

## FROM THE INVESTMENT IDEA TO THE RIGHT DECISION



Potential of cost savings in relation to project progress.

The path from the project idea to the investment decision is often long and difficult. It involves considerable expenditures by the investor in regard to both time and money.

This is where we can be of assistance. As a competent and experienced engineering, plant-building and lifecycle partner, we ensure that in every project phase your resources are applied economically and according to your requirements. The diagram above illustrates that with a clear economic understanding, the investor has an enormous potential for savings. This potential, which can be realized with our advanced capabilities, may also be available in later project stages.



YOUR EARNING POTENTIAL IS MAXIMIZED WITH Primetals Technologies ON YOUR SIDE

# PHASES OF PROJECT DEVELOPMENT

## OPPORTUNITY & FEASIBILITY STUDIES



Project studies represent a useful tool for successful project development.

### PROJECT DEFINITION

Production capacity, production quality and overall economic goals can only be realized when the various individual project elements are intrinsically combined into a holistic technical and financing concept.

Project studies, for example opportunity, pre-feasibility, feasibility and second-opinion studies, represent a useful tool to attain an exact project definition. They also serve to clarify the complex interrelationships within the plant concept.

The investor, as well as the operator of the plant, profits from thorough investigations before an investment decision is made. After all, it is essential to establish a project's profitability over a lifecycle that can last decades.

### PHASES OF PROJECT DEVELOPMENT

First, the initial situation has to be examined and defined with regard to:

- Market and competition
- Raw materials
- Site location
- Product mix
- Capacity
- Product and prices
- Overall plant layout and logistics

### Then, it's time to propose an overall concept through the:

- Selection of the technologically possible process routes, highlighting the most promising process routes on the basis of specific project conditions.
- Evaluation of the process routes with the help of project studies, for example concept and support studies (market review, energy supply and demand study, engineering study, laboratory/pilot tests, location and site study, soil investigation, environmental impact study, benchmark study, structure of financing, etc.). With the results of the studies, the client is in a position to decide on the preferred configuration.
- Determination of the internal rate of return, payback period, risk analysis, etc., for the preferred plant configuration. For this purpose, an economic evaluation supports the subsequent pre-feasibility and/or feasibility study.

Finally, with the above information, the client is in a position to make the right decision for project implementation with respect to the existing conditions and requirements. With the studies mentioned above, the following key information is available:

- Operating and production costs
- Consumption figures
- Investment budget figures
- Economical and financial indices and profitability rates

# ECONOMIC VIEW OF PROJECT DEVELOPMENT



## ECONOMIC EVALUATIONS

The main objective of an economic evaluation is to identify investment opportunities with regard to technological solutions and to gain an accurate picture of key economic figures. The identification and interpretation of sensitive parameters through sensitivity and risk analyses aids the decision-making process for clients and suppliers.

The economic evaluation comprises the scope of investment based on the selected process configuration, including the net working capital, the production and marketing costs, and sales revenues. Computing a cash flow line over a lifetime helps calculate key figures like internal rates on total investment and equity.

The calculation of key figures like free cash flow, equity-based cash flow, profitability rates, internal rate of return on total investment/equity, the contribution margin, financial ratios and break-even points helps develop a project through several stages. The results also facilitate investment promotion and financing, and provide a better basis for project decisions and implementation by making the details of investments more transparent.

In the end, the realization of any project requires a general survey from the early beginning.



# FINANCIAL SERVICES TAILORED FINANCING SOLUTIONS



Tailored financial solutions are part of the Primetals offering.



Primetals is a core partner of several export credit agencies.

## EXPERT FINANCING

Project financing structures are rather complex and require proven project management to implement them efficiently. Therefore, Primetals Technologies provides you with tailored financing solutions based on in-depth industry, country-specific and financial knowledge. We have extensive and long-year experience and competence in developing and implementing suitable financing solutions for projects in the metal technologies field worldwide. We are a partner who understands and skillfully manages the challenges and opportunities unique to this sector.

We support our customers in designing and arranging short-, medium- and long-term financing structures, usually in conjunction with commercial banks, multilateral agencies and export credit agencies (ECAs). And in the case of structured financing solutions, we work with renowned international trading houses. Primetals is a partner for comprehensive financing solutions that best address the individual needs of its customers.

We are a core partner of leading ECAs due to the multi-sourcing character of our projects. We have an excellent, long-standing relationship with international banks, and we have experience in export and project financing. Primetals Technologies has broad experience and know-how, and extensive networks to support overall project financing.

We are

- Professional - proven by the successful implementation of a wide range of diverse financial projects worldwide.
- Responsible - dedicated to ethical and sustainable conduct.
- Innovative - providing tailored financing solutions best suited to the specific needs of our customers, thus creating additional value for our customers and enhancing their competitiveness.
- Multinational - a global center of expertise for financing, securitization and financial risk.
- Efficient - through in-depth knowledge of our customers' business combined with long-standing sector experience.



# TURNKEY SERVICES

## SUCCESS FROM A SINGLE SOURCE



Primetals Technologies offers efficient turnkey solutions.

### CUSTOMIZED TURNKEY SERVICES

Full-line expertise: Our experience and expertise in all aspects of the metallurgical production chain make Primetals Technologies your perfect worldwide partner for integrated solutions.

Single-source solutions for the entire metallurgical process route have been successfully implemented in more than 1,800 projects worldwide.

Primetals Technologies' turnkey services, which address balance-of-plant concerns, offer support in a variety of areas, including construction, steel structures, building services, fire protection, cranes and transport systems, corrosion protection and insulation, cooling water and utility systems, waste water and slurry treatment, installation planning, and complete construction site management.

### INTEGRATED SOLUTIONS FOR END-TO-END EXCELLENCE ACROSS THE METALS VALUE CHAIN

IRONMAKING > STEELMAKING > CONTINUOUS CASTING > HOT ROLLING > COLD ROLLING > STRIP PROCESSING

#### PRIMETALS TECHNOLOGIES' CORE EXPERTISE

- Project cost and progress monitoring
- Basic and detailed engineering
- Specifications for equipment and construction work
- Scheduling and site management
- Technical quality and accuracy assurance

The result is optimal coordination between all interfaces.

# TURNKEY SERVICES

## CUSTOMIZED SCOPE OF SUPPLY FOR TURNKEY SOLUTIONS



### CIVIL WORKS

Civil works covers the areas of building and concrete construction. Services offered include design, construction engineering as well as construction management. In all phases we draw on the experience we have gained in projects all over the world.

### STEEL STRUCTURE

Primetals Technologies develops and builds customized steel structures adapted to the specific requirements of metallurgical production plants. Our experience from well over 100 completed plants ensures that your project is perfectly executed.

### CRANES, ELEVATORS AND VEHICLES

Mobile components such as cranes play a crucial role in the efficiency of modern metallurgical production.

### BUILDING SERVICES

Climatic conditions determine the working atmosphere inside the plant. Primetals Technologies' building services lay the foundation for optimum plant productivity, and create a basis for an optimized working environment. Furthermore, our specialists place great importance on the protection of human life and the safeguarding of equipment.

### WATER MANAGEMENT

In the modern metallurgical industry, efficient water management is not only a means to an end, but a guarantee for economical and ecological process flows. Perfect integration into the entire system is vital to ensure competitiveness in the future. Implementation is always in line with local legal requirements, environmental protection legislation and customer standards.

### PROFESSIONAL CONSTRUCTION ENGINEERING AND SITE MANAGEMENT

For construction engineering, site management and site monitoring, our professional handling of the site ensures the quality of the plant and guarantees adherence to both the budget and the schedule.

# CUSTOMIZED TURNKEY MODELS ALWAYS ON YOUR SIDE

Primetals Technologies provides a wide range of turnkey execution models to meet your specific needs, always with the goal of optimizing your investment budget.

Two factors come to the fore here:

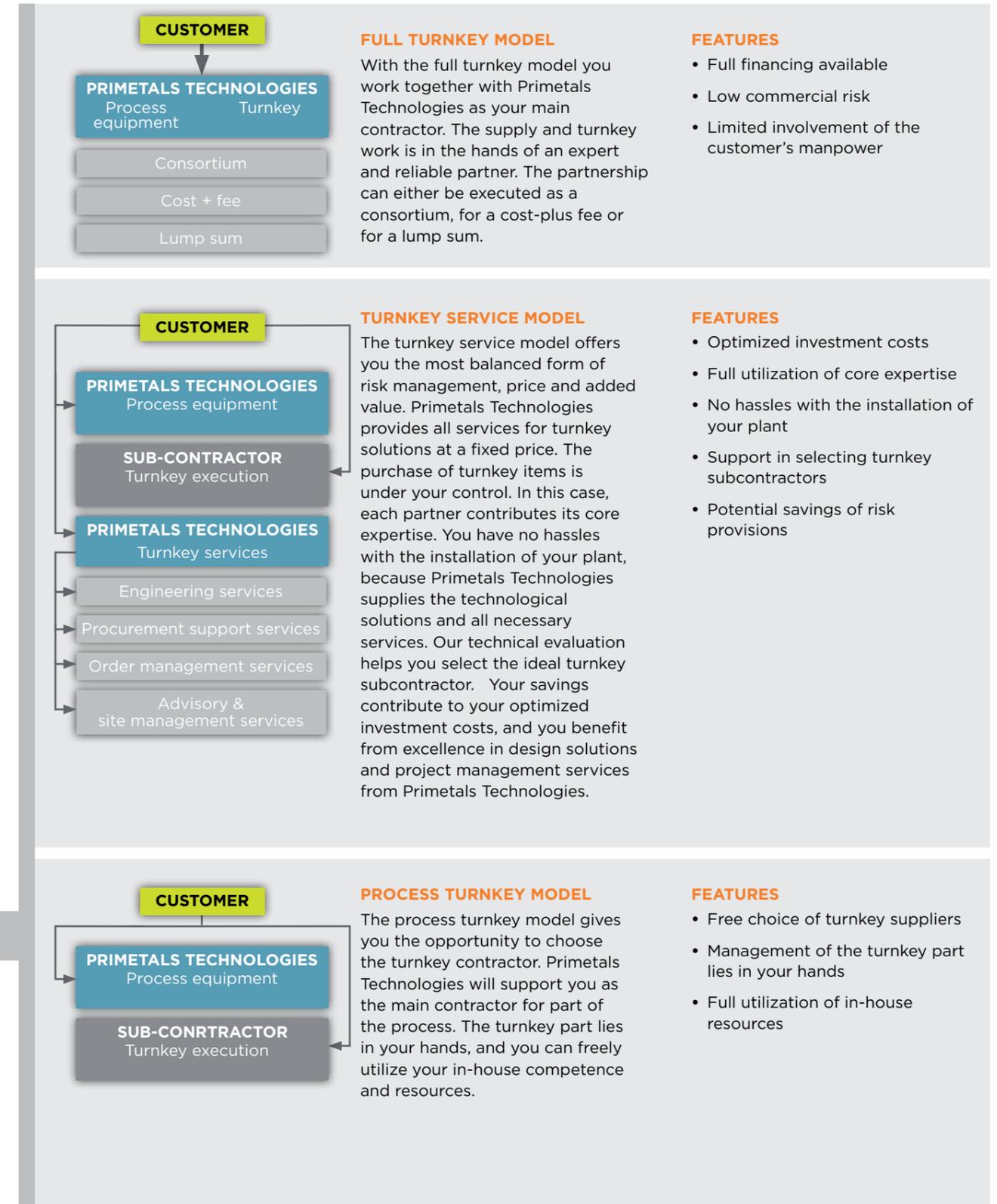
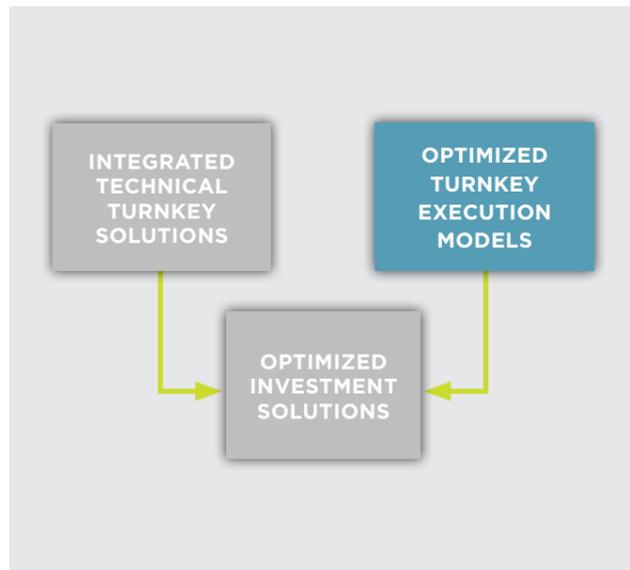
- **Integrated technical turnkey solutions** are optimally integrated with metallurgical technology to provide a solid foundation for optimized investment costs.
- **Optimized turnkey execution models** focus on risk management as well as manpower and project control.

When combined, these two factors help keep investment costs to a minimum. No matter which solution fits your needs, Primetals Technologies is your experienced and reliable partner. We focus on innovation and state-of-the-art solutions to optimize your investment costs.



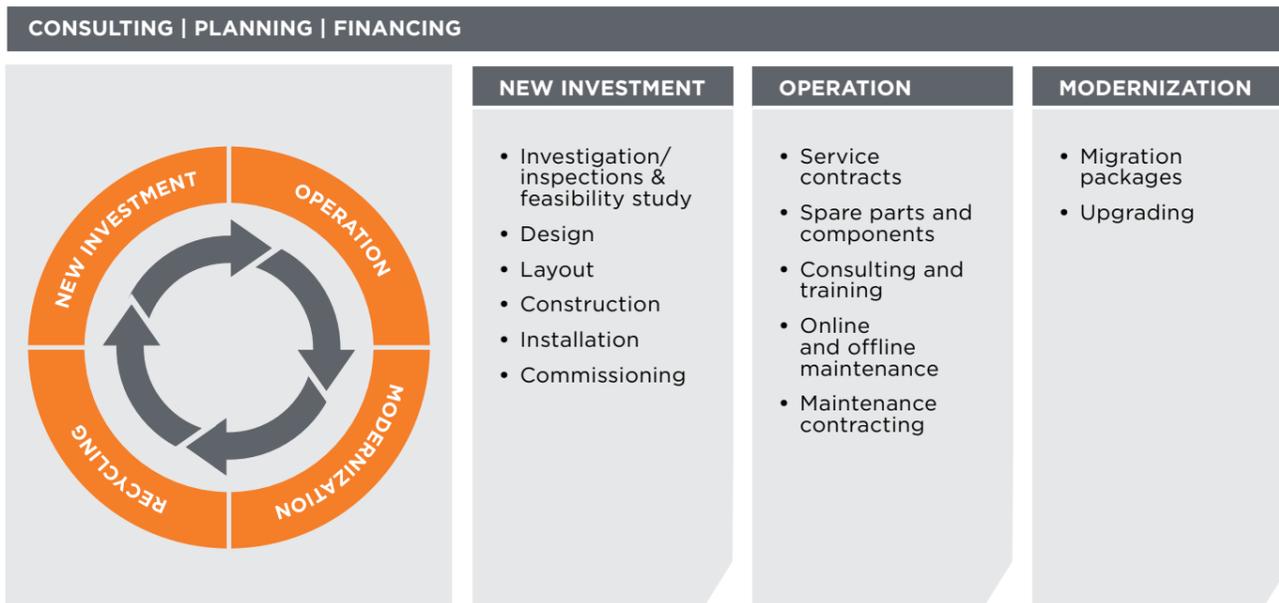
## MAIN BENEFITS

- Few technical interfaces since all components are well integrated in the overall concept
- Overall quality is guaranteed by partnership with qualified subcontractors
- Well-planned project management ensures on-schedule completion and smooth start-ups for short payback periods



# LIFECYCLE MANAGEMENT

## A PARTNERSHIP THAT NEVER ENDS



### PRIMETALS TECHNOLOGIES LIFECYCLE SERVICES

As a plant operator, you have conflicting needs. On the one hand, your performance is measured each quarter against short-term profitability expectations. On the other hand, compared with the capital market, you have to think on a totally different time scale. Depending on the lifetime of your plant, you have to take 15 years or more into account. At the very least, that's 60 full financial quarters.

But thanks to our comprehensive expertise and integrated approach to solutions, you benefit in both the short and long term from our lifecycle services.

In the short term: Backed by our extensive experience with many reference plants, we provide you with the certainty of fast, dependable production start-up and shorter amortization periods. In the long term: Our master plan guarantees competitive performance for your plant in every phase of its lifecycle. Whether we're providing 24/7 technical support, optimizing maintenance or making permanent plant improvements, we're always working to ensure the cost-effective operation of your plant.

# PROCESS & TECHNOLOGY CONSULTING

## INCREASE PLANT PERFORMANCE AND REDUCE CONVERSION COSTS



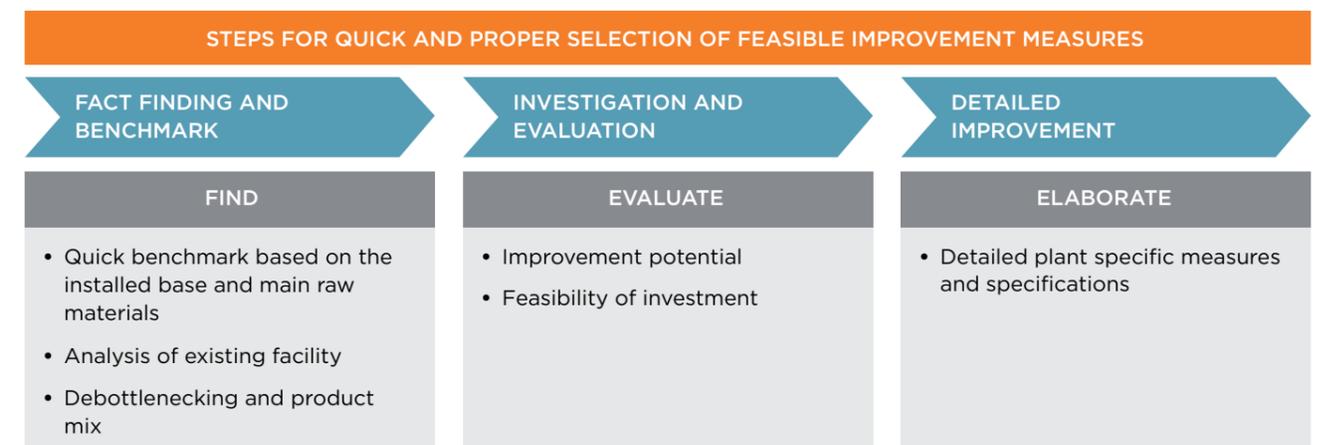
Consulting through out the whole metallurgical production chain.

### PROCESS AND TECHNOLOGY CONSULTING

You can profit from our integrated process know-how and global presence. Process and technology consulting help increase plant performance and reduce conversion costs to support quick and proper selection of feasible improvement measures.

Primetals Technologies offers technology-consulting services that help operators to achieve and maintain high standards in production excellence.

On the basis of decades of experience in the engineering, installation, start-up and commissioning of steelmaking plants worldwide, our specialists are skilled in identifying potential for plant performance improvement in the course of a performance check. Detailed and individual concepts are proposed to optimize processes and adapt technological equipment to deal with different qualities of raw material. By implementing these measures, operators can ensure permanent production excellence and stay in line with environmental goals and remain cost effective.



# PROCESS & TECHNOLOGY CONSULTING

OFFERS THE FOLLOWING AREAL THROUGHOUT THE METALLURGICAL PLANTS



PLANT SPECIFIC CONSULTING

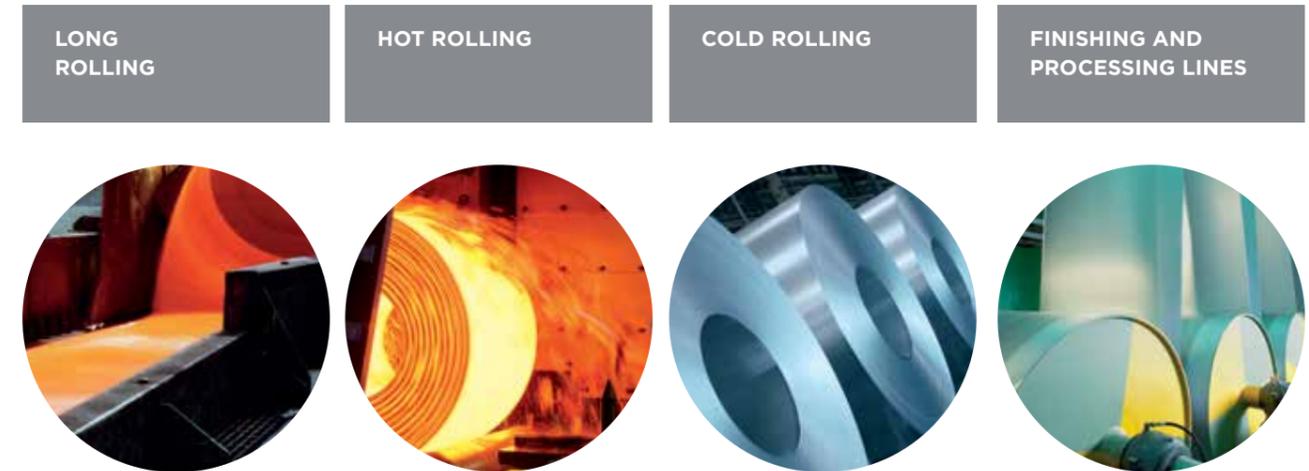
INTEGRATED CONSULTING



PLANT SPECIFIC CONSULTING
Plant assessment
Upgrade/modernization
Equipment/technological packages
Plant performance
Operational assistance and training
Product quality
Energy efficiency & environmental protection
Tests and simulation
Electrics and automation
Maintenance studies

INTEGRATED CONSULTING
Optimization of product mix
Logistic studies
Debottlenecking
Conceptual and feasibility studies
Energy and environmental concepts
Water studies

# INCREASE PLANT PERFORMANCE AND REDUCE CONVERSION COSTS



**40 M€ ANNUAL ENERGY COST SAVING POTENTIAL IDENTIFIED**  
 The study carried out by Primetals Technologies identified and elaborated many potential improvements and projects in the area of heat recovery that will significantly improve our energy efficiency.

Based on the experience of more than 500 successfully executed process & technology consulting studies the experts of Primetals Technologies are ready to serve as your life cycle partner!

**UP TO 10% COST REDUCTION FOR HOT ROLLED COIL**  
 by implementation of improvement measures identified in the executed study to reduce conversion costs, increase yield and comply with quality targets in our plant.

**DECREASE AOD TAP-TO-TAP TIME BY 15 MINUTES AND AR CONSUMPTION BY 6-9 NM<sup>3</sup>/T**  
 by implementation of new blowing pattern plus new vessel and refractory design.

# SELECTED INTEGRATED PLANTS & SOLUTIONS REFERENCES



## CORPORATED INTEGRATED PLANTS AND SOLUTIONS

Metinvest  
**EUROPE**  
Sinter plant, steel plant, slab caster  
Process turnkey

ISD  
**EUROPE**  
Melt shop, slab caster, billet caster, cold rolling mill, pickling line, plate mill (modernization)  
Process turnkey

**Primetals Technologies Austria GmbH**

A joint venture of Mitsubishi Heavy Industries and partners

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Austria

[primetals.com](https://www.primetals.com)

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