Strategy Update 2017
Investing in Sustainable Development

London, November 2017
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CEO Vision

Vladimir Potanin
President
Chairman of the Management Board
In 2018-2022 Nornickel will...

- ...Become greener and help others to get greener
- ...Enter into a new investment cycle to ensure sustainable development and create a platform for growth
- ...Continue creating long-term value for the shareholders
Aspiration for “Green” Nornickel

Improving environmental footprint in Russia...

- Completed Downstream reconfiguration which enabled the shutdown of outdated production facilities, thereby reducing SO$_2$ emissions in the residential area by 30–35%
- Comprehensive sulphur capturing programme at Nadezhda and Copper smelters to be implemented by 2023

Total SO$_2$ emissions in Norilsk area

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2023 target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions</td>
<td>-75%</td>
<td></td>
</tr>
</tbody>
</table>

...while supporting enhanced environmental conditions globally

Providing critical metals to the growing electric vehicles (EV) industry

Supplying critical metals to the auto catalyst producers

Source: LMC Automotive
Launch of a New Investment Cycle to Ensure Long-Term Sustainable Development

Capital investments, 2013–2020

*USD bn per year*

<table>
<thead>
<tr>
<th>Optional growth projects</th>
<th>Environmental projects and launch of a new asset modernization cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.5</td>
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<tr>
<td>1.5</td>
<td>1.5</td>
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</tbody>
</table>

Forecast for 2018-2020

<table>
<thead>
<tr>
<th>Unprecedented environmental programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of SO₂ capturing technologies and reconfiguration of the copper production chain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed asset modernization cycle</th>
</tr>
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<tbody>
<tr>
<td>Comprehensive infrastructure modernization</td>
</tr>
<tr>
<td>Full-scale implementation of equipment replacement strategies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities for growth after 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in operational efficiency</td>
</tr>
<tr>
<td>Focus on Talnakh deposit development</td>
</tr>
<tr>
<td>Preparation of potential growth opportunities</td>
</tr>
</tbody>
</table>
Ensuring High Shareholder Returns

In terms of shareholder returns, Nornickel leads the industry by a wide margin... 

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>TSR, 2013–2017 YTD, %</strong></td>
<td>60</td>
<td>26</td>
</tr>
<tr>
<td><strong>Average dividend yield, 2013–2017 YTD, %</strong></td>
<td>26</td>
<td>-32</td>
</tr>
</tbody>
</table>

...with a dividend yield four times higher than the industry average *

Assuming dividends at the floor level (USD 1 bn) Nornickel’s dividend yield is still expected to exceed the industry average

<table>
<thead>
<tr>
<th></th>
<th>Industry Minimum</th>
<th>Nornickel’s dividend floor</th>
<th>Industry average</th>
<th>Industry maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5</td>
<td>3.5–4.0</td>
<td>3.3</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Note: 1. Based on the sample of 16 diversified, copper and PGM companies; 2017-2022 Consensus forecast
Health & Safety: Improved Safety Records

LTIFR reduced by almost 60% since 2013

Assessment of occupational safety culture score improved almost 80% since 2013

- LTIFR remains below the global mining industry average
- Company committed to create a strong safety culture at all levels of the organization
- Company continues to focus on personnel and process safety across all operations

Strategic Objectives:

1. Zero-fatality on production sites
2. Continuous improvement of LTIFR

Bradley Curve indicator, DuPont Assessment
Comprehensive Environmental Program

**Polar Division**

- Total SO$_2$ emissions in the Norilsk Industrial Area

- 2015
- 2023 target

- -75%

**Phase I: 2013–2016**

- Talnakh Concentrator, Stage 2
  - Downstream reconfiguration completed

- Nickel Smelter
  - Nickel Smelter shut down

- Emissions reduced in the residential area of Norilsk: 30-35%

**Phase II: 2017–2022**

- Nadezhda Smelter
  - Comprehensive sulphur capturing solution
  - Construction of new converters (replacing converting operations at Copper Smelter)

- Copper Smelter
  - Expansion / upgrade project at the Sulphur production facilities

- CAPEX: up to USD 2.5 bn

**Kola MMC**

- Total SO$_2$ emissions in Nickel town

- 2015
- 2019 target

- Up to -50%

**2017–2019**

- Smelting shop in Nickel town

- Reduction of smelting operations at the Norwegian border

- CAPEX: USD 60–70 mln
Configuration of Polar Division's Environmental Program at Phase II: Three Key Projects

Key emission reduction projects at Nadezhda and Copper Smelters

1. Comprehensive SO₂ capturing project
   - SO₂ capturing project - production of sulphuric acid and neutralisation with limestone
   - Limestone production
   - Sulphuric acid neutralisation
   - Gypsum stockpiling

2. Transfer of converting operations from Copper to Nadezhda Smelter
   - Electrolysis
   - Cu cathodes

3. Reconstruction and expansion of the elementary Sulphur production facilities
   - Smelting
   - Expansion and upgrade of the existing Sulphur production facilities

Investment optimization

2018–2022, USD bn

- Initial technical solution
- Approved projects

Notes: 1. As part of the project, the Company plans to expand its limestone production capacities; 2. The 2010-2012 technical solution envisaged construction of a sulphur capturing and elementary sulphur production facility at Nadezhda Metallurgical Plant (see the next slide), implementation of a similar project at Copper Smelter, and plans to set up a continuous copper matte converting facility at Copper Plant.
**SO₂ Utilization Project at Nadezhda Smelter: Sulphuric Acid Production and Neutralisation**

<table>
<thead>
<tr>
<th>Technology</th>
<th>SO₂ capturing and production of elementary sulphur</th>
<th>Unique technology involves high operational risks</th>
<th>USD bn</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial project:</td>
<td>SO₂ capturing, production of elementary sulphur</td>
<td>The technology is widely used globally, including Russia</td>
<td>2.1–2.2</td>
<td>Project design completed</td>
</tr>
<tr>
<td>elementary</td>
<td></td>
<td></td>
<td></td>
<td>Detailed engineering developed by SNC-Lavalin Inc.</td>
</tr>
<tr>
<td>sulphur</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved project:</td>
<td></td>
<td></td>
<td>1.4–1.5</td>
<td>Feasibility study completed</td>
</tr>
<tr>
<td>sulphuric acid</td>
<td></td>
<td></td>
<td></td>
<td>Investments into the design phase approved</td>
</tr>
<tr>
<td>and neutralisation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nadezhda</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smelter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Launch**
  - SO₂ Utilization Project at Nadezhda Smelter: Sulphuric Acid Production and Neutralisation
  - 2023

- **Status**
  - Feasibility study completed
  - Investments into the design phase approved
Emissions Reduction in Nickel Town (Kola MMC): Separation and Sales of Low-Grade Concentrate

Current and prospective designs of production flows at Kola MMC

Current

- Ore from Kola mines
- Production of bulk concentrate
- Production of high-grade matte
  - Furnaces:
- Production of saleable metals at Severonickel
- Metal Sales

Prospective

- Production
  - High-grade concentrate: Reduced volumes for smelting will result in lower emissions in Nickel town
  - Low-grade concentrate
  - Production of high-grade matte
    - Furnaces:
  - Sales of low-grade concentrate

Environmental impact

Total SO₂ emissions in Nickel town, Mtpa

- Up to 50%
- 2015 target: 80
- 2019 target: 40

Sales of low-grade concentrate

Concentration

Smelting

Sales
Strategic Roadmap of Key Production Assets Development

Roadmap to advanced, highly efficient and environmentally friendly production processes

- **Kola MMC**
  - Optimisation of the Smelting shop’s operations to reduce $SO_2$ emissions (2018)
  - Upgrading and expansion of nickel refining capacity (2019)

- **Severonickel**
  - Reconfiguration program in Norilsk completed in 2017
  - Intensive development of Talnakh ore reserves (2017-2022)

- **Polar Division**
  - Implementation of the comprehensive environmental programme (2023)

- **Chita project**
  - Construction completion

- **By 2022**
  - Potential further Talnakh Concentrator Upgrade, Stage 3 (+8 Mtpa)

- **By 2022-2024**
  - Potential development of the South Cluster (growth option)
### Status of Key Upstream Projects

#### Ore mining at the Talnakh cluster

<table>
<thead>
<tr>
<th>Ore, Mt</th>
<th>2014</th>
<th>2017</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skalistaya mine</td>
<td>14.5</td>
<td>15.4</td>
<td>15.4</td>
</tr>
<tr>
<td>Talnakh excluding Skalistaya mine</td>
<td>13.5</td>
<td>13.7</td>
<td>11.3</td>
</tr>
</tbody>
</table>

- **Talnakh brownfields under construction**
- **Skalisty mine ramp-up**
- **Ore mining without additional investments**

#### Highlights

- The investment programme ensures stable ore output in the mid-term.
- The ramp-up of the Skalisty mine should help to maintain metal grades in the ore.
- Total investment in the development of Talnakh’s upstream projects is forecasted to be up to USD 1.5 bn in 2018–2020.

#### Ore mining at Zapolyarny mine (South cluster)

<table>
<thead>
<tr>
<th>Ore, Mt</th>
<th>2014</th>
<th>2017</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zapolyarny open pit</td>
<td>2.7</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Zapolyarnaya underground mine</td>
<td>1.5</td>
<td>0.4</td>
<td>1.2</td>
</tr>
</tbody>
</table>

- In the base case scenario, production at the Zapolyarny mine will decrease to current underground mining volumes.

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*Notes:*
- Ore mining at **Talnakh cluster**.
- Ore mining at **Zapolyarny mine** (South cluster).

*Images and tables are visually represented in the document.*
Skalisty Mine: Project Development on Track

Project Highlights

- Progress in 2016-2017:
  - Shaft sinking: 1.328 m
  - Drifting: 7.654 m

- Production capacity – 2.4 Mtpa
- Ore reserves – 58 Mt
- Project IRR (as of 01.2013) – 29%
- CapEx 2013–2016: USD 881 mln
- CapEx 2017–2020: ~ USD 1.0 bn

Project overview

- Commissioned mining capacity – 300 Ktpa in 2016-2017
- Total mining capacity 1.75 Mtpa in 2017
- Next launch – 400 Ktpa in 2018
- Completion of ventilation shaft #10 in 2018
- Completion of main shaft in 2019

Project timeline

Project update

- Progress in 2016-2017:

Skalisty Mine

[Image of Skalisty Mine]
**Downstream Reconfiguration Program**

**Nickel Smelter shutdown**

Result: Reduction of SO₂ emissions in the Norilsk residential area

- ▼ 30–35%

Completed

**Upgrade and expansion of Nadezhda Smelter**

Result: Increase in capacity, Mt

- +26%

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (Mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1.9</td>
</tr>
<tr>
<td>2018</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Completed

**Upgrade and expansion of Talnakh Concentrator**

Result: Increase in capacity, Mt

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (Mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>7.5</td>
</tr>
<tr>
<td>2018</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Ni-Po conc upgrade, Ni content (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ni-Po conc</th>
<th>Ni content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>5.8</td>
<td>9.5</td>
</tr>
<tr>
<td>2018</td>
<td>7.5</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Completed

**Upgrade of Nickel Refinery at Kola MMC**

- Implementation of a new chlorine leaching technology
- Expansion of nickel refining capacity from 165 Ktpa to 190 Ktpa

In progress

**Impact of reconfiguration on EBITDA**

- **2018:** circa USD 100 mln as a result of increased total recovery rates of base metals and a shorter production cycle
- **Positive EBITDA impact to be enhanced** through the Comprehensive Efficiency Improvement Programme and once final production footprint is achieved
- **The increased recovery rates are reflected in the production guidance**¹ for 2018–2020

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Note: 1. Reconfiguration will contribute to maintaining stable base metals production levels to offset the reduction of secondary feedstock and decreasing production at Zapolarany mine (~1.2 Mt in three years)
Upgrade of Kola Nickel Refinery

Project status

- Construction works are underway at all facilities
- 42 cells based on the new chlorine leaching technology have been installed
- Construction progress: ~40% completed

Next steps

- Completion of infrastructure development
- Phased capacity commissioning in 2018
- Reaching design capacity and parameters in 2019

Projected impact

- Increase in nickel recovery from high-grade matte by over 1.0%
- Optimisation of the work-in-progress inventory levels
- CAPEX (full project) circa USD 300–350 mln
Bystrinsky (Chita Copper) Project

Project overview

- Hot commissioning started (completion planned for 1H 2018)
- Ore reserves: 341 Mt, grades: Cu – circa 0.7%; Fe – circa 21%; Au – circa 0.9 g/t
- Site infrastructure: open pit, concentrator (grinding and flotation), camp, etc.
- External infrastructure:
  - 234 km of 220 kV power lines constructed
  - 223 km railway to the site constructed (public–private partnership)

Project highlights

<table>
<thead>
<tr>
<th>Annual production volumes</th>
<th>2018</th>
<th>2021+</th>
<th>CAPEX</th>
<th>EBITDA’20+</th>
<th>Cash cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ore (Mt)</td>
<td>6-7</td>
<td>10</td>
<td>~1.7</td>
<td>0.4-0.5</td>
<td>0.3-0.4</td>
</tr>
<tr>
<td>Cu (Kt)</td>
<td>35-40</td>
<td>~70-75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Au (Koz)</td>
<td>180-200</td>
<td>250-260</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fe (magnetite Kt)</td>
<td>1 400-1 600</td>
<td>~ 2 900</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key corporate development milestones

- Sale of a **13.3%** stake to a consortium of Chinese investors (closed)
- Sale of a **36.6%** stake to CIS NRF Holdings Limited (closed)
- Potential IPO considered
Pipeline of Perspective Growth Projects

Norilsk Nickel also continues broader screening of potential greenfield opportunities that fit its strategic criteria.

The Company will leverage its experience with Bystrinskiy project in the pursuit of potential opportunities.

Map of potential growth opportunities post 2022

- **Talnakh**
  - Capacity expansion projects
  - **Status:** Comprehensive feasibility studies / strategic mine plans development in progress

- **Maslovskoye Field**
  - Potentially, the largest greenfield PGM asset
  - **Status:** Pre-feasibility study completed

- **South Cluster**
  - Potentially, a Top-5 PGM producer in 6–7 years
  - **Status:** Feasibility study in progress
  - Dialogue on potential cooperation / coordination with other license holders in the region

- **Baimskaya project**
  - Potential to become Tier-1 Copper asset
  - **Status:** Pre-feasibility study completed
**Growth Opportunities: South Cluster and Upgrade of Talnakh Concentrator, Phase 3**

**Geography**

- Talnakh Concentrator
- Talnakh Ore Cluster
- Lebyazhye tailing dam
- Copper Smelter's slags
- Zapolyarny mine
- Norilsk Concentrator

**Growth opportunities**

<table>
<thead>
<tr>
<th>Talnakh Concentrator, Phase 3</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ More efficient enrichment technologies for low-grade ores – yielding potentially higher recoveries (compared with Norilsk Concentrator)</td>
<td>Feasibility study underway (to be completed in 1H 2018)</td>
</tr>
<tr>
<td>▪ Implementation of these technologies at Norilsk Concentrator is impossible without total overhaul of existing facilities</td>
<td></td>
</tr>
<tr>
<td>▪ Potential optimisation of transportation costs</td>
<td></td>
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</tbody>
</table>

**South Cluster**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Potential to become a Top-5 PGM producer globally based on a significant reserve base</td>
<td>Geological data updated</td>
</tr>
<tr>
<td>▪ Efficient capacity utilization of Norilsk Concentrator (after completion of Phase 3 at Talnakh Concentrator)</td>
<td>Final investment decision to be considered in 1H 2018</td>
</tr>
<tr>
<td></td>
<td>The licence has been transferred to a standalone legal entity within Nornickel’s perimeter to expand potential funding opportunities</td>
</tr>
</tbody>
</table>
Infrastructure Renewal Cycle: 2018–2022

Gas transportation system (705 km of pipelines to be replaced)
Execution of modernization strategy that earlier allowed to optimize CAPEX in 2014–2017 (based on revised technological solutions)

Replacement programs for key production equipment:
- Replacement of key equipment categories yielding positive impact on overall equipment efficiency
- Upgrade of mine support systems targeting further improvement of HSE performance

Utilities:
Comprehensive programmes to replace / modernize power lines (30 km), gas distribution networks (111 km), clean water supply system in Dudinka, etc.

Logistics infrastructure:
Reconstruction of critical facilities (ports, fuel storages and supply infrastructure etc.)

Power supply:
Gradual replacement of retiring power units (550 MW)

Auxiliary production:
Supply of necessary materials (e.g. the limestone pit)
CAPEX Program 2013-2020

USD bn

2013: Key construction phase of Bystrinskiy (Chita) project
2018: Final payments for Bystrinsky; completion of major facilities construction at Skalisty as well as Komsomolsky and Taimyrskiy mines
2019+: launch of Sulphur project construction, intensification of infrastructure modernization and equipment replacement programs (renewal cycle)

Optional (growth) projects
- Commercial projects (including Chita project)
- Stay-in-business (including Environmental program)

Average 2019-2020 (forecast): 2.3-2.5
2017 (forecast): 2.0 up to 0.1
2018 (forecast): 1.1-1.2
2017: 1.9
2016: 1.7
2015: 1.7
2014: 1.3
2013: 1.0
2018 Investment Plan – USD 2 bn

**Growth projects**

- **Preparation of optional (growth) projects**
  - (Talnakh expansion projects, 3rd stage of Talnach concentrator upgrade, South Cluster)
  - Design and engineering surveys
  - Pre-payment for equipment with long lead time (subject to investment approval by the end of 2018)

**Environmental program**

- **Environmental program**
  - Detailed engineering study, engineering surveys and site preparations for Sulphur projects
  - Contracting for Sulphur project at Copper Smelter

**Base investment program**

- **Chita project**
  - Construction completion / final payments

- **Reconfiguration**
  - Kola Refinery upgrade / expansion project

- **Mining projects**
  - Upstream projects to maintain metals production level
  - Completion of major facilities at Skalisty, Komsomolskiy and Taimyrskiy mines

- **Efficiency Improvement programs and initiatives**
  - IT, automation, R&D, equipment efficiency improvement

- **Maintenance of Infrastructure Assets**
  - Reconstruction / modernization of infrastructure (energy, logistics, social etc.)

- **Maintenance of Production Assets**
  - Maintenance of existing production facilities (replacement of equipment, compliance with regulatory requirements, etc.)

**2018 Plan**

- **1.8-2.0**
  - 100–150
    - Environmental program

- **1.7-1.9**
  - 150-200
    - Chita project
    - Construction completion / final payments
  - 200-250
    - Reconfiguration
  - 400-500
    - Mining projects
  - 120-170
    - Efficiency Improvement programs and initiatives
  - 250-290
    - Maintenance of Infrastructure Assets
  - 400-450
    - Maintenance of Production Assets
### 2019-2020 Investment Plan – USD 2.3-2.5 bn Including Environmental Program

**USD mln pa**

<table>
<thead>
<tr>
<th>Growth projects</th>
<th>Environmental program</th>
<th>Base investment program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3 – 2.5</strong></td>
<td><strong>550–800</strong></td>
<td><strong>2.3 – 2.5</strong></td>
</tr>
<tr>
<td><strong>2.3 – 2.5</strong></td>
<td><strong>550–800</strong></td>
<td><strong>1.6 – 1.8</strong></td>
</tr>
<tr>
<td><strong>550–600</strong></td>
<td><strong>550–600</strong></td>
<td><strong>2.3 – 2.5</strong></td>
</tr>
<tr>
<td><strong>550–600</strong></td>
<td><strong>550–600</strong></td>
<td><strong>2.3 – 2.5</strong></td>
</tr>
</tbody>
</table>

- **Potential execution of growth projects** (Talnakh expansion projects, 3rd stage of Talnakh concentrator upgrade, South Cluster)
- Investment decisions are scheduled in 2018-2019 subject to IRR passing the threshold level
- Potential investment cycle of 3 to 5 years

- **Environmental program**
- Construction phase for all projects; peak of investments is expected in 2020
- Remaining 2021-2022 CAPEX is expected at the level of USD 1.0-1.2 bn

- **Reconfiguration**
- Completion of current reconfiguration program
- Start of a new reconfiguration program at Kola Division

- **Mining projects**
- Upstream projects to maintain metals production level

- **Efficiency Improvement programs and initiatives**
- IT, automation, R&D, equipment efficiency improvement

- **Renewal / modernization of Infrastructure Assets**
- Investments in infrastructure – up 50-60% vs. 2018
- Major renovation of infrastructure facilities: replacement of power units, gas pipelines, electric networks, reconstruction of fuel storages, etc.

- **Maintenance and upgrade of Production Assets**
- Investments growth of 30-40% vs. 2018 due to full-scale replacement of key equipment categories
Production Guidance

### Ni (Kt)
- **2016**: 197
- **2017**: 206–211
- **2018-2020**: 210–215

### Pt+Pd (tonnes)
- **2016**: 97
- **2017**: 100–105
- **2018-2020**: 100–105

### Cu (Kt)
- **2016**: 344
- **2017**: 377–387
- **2018-2020**: 400–420

- Stable Ni and PGM output
- Increase of copper production due to processing of secondary feedstock (concentrate) and expected higher Cu grade in ore

*Note: 1. Metals produced from own feedstock*
Finance and IT strategy: Focus on Efficiency

Sergey Malyshev
Senior Vice-President
Chief Financial Officer
Management of Operating Cash Costs

1H2017 Cash cost breakdown

- Labour: 41%
- Metals and semi-products: 19%
- Materials and supplies: 19%
- Services: 5%
- Other: 16%

1H2017 adjusted by FX and metal purchases

Operating cash costs growth net of macroeconomic factors: in line with domestic inflation

USD mln

- Labour: 651 -> 687 (+6%)
- Metals and semi-products: 219 -> 192 (-12%)
- Materials and supplies: 273 -> 329 (+21%)
- Services: 83 -> 84 (+1%)
- Other: 247 -> 272 (+10%)

YoY change %
Norilsk nickel comprehensive cost reduction ecosystem

Annual cost reduction by USD 200-300mln from 2020

- Launch a unit cost optimization and productivity improvement programme
- Employ best international practices, including employment of leading experts and personnel training

Program foundation

- Modernise production assets
- Reconfigure and shut down outdated capacities
- Implement industrial automation systems
- Develop and implement new processes and standards
- Implement ERP systems / automated control systems
- Implement new managerial approaches
Upgraded IT Infrastructure Provides a Platform for Higher Operating Efficiency

1. **SAP ERP roll-out**
   - Pilot project completed
   - Roll-out for Chita and Polar Division planned for 2017 and 2018 respectively

2. **New data centre platform**
   - Server infrastructure and data storage facilities fully upgraded to meet company demands
   - Enterprise data network modernised

3. **Underground radio and positioning system**
   - 369km of optical cable
   - 1,052 Wi-Fi access points
   - Real-time control of mine personnel and machinery

4. **High-speed fiber cable to Norilsk**
   - 956km of cable commissioned at 40 Gbit/s
   - Extremely challenging tundra climate
   - Enables the use of modern IT solutions
   - Improved quality of life for residents of Norilsk

5. **MES layer**
   - Dispatching system pilot project in active phase in Norilsk
   - 3D mine design and planning pilot project completed for 1 mine, now rolled out onto other mines
   - Metall Accounting pilot project completed for Talnakh concentrator, now rolled out onto other plants and mines
**Improvement of the Efficiency of Maintenance Operations is One of the Key Elements**

- **Segmentation of assets and selection of appropriate maintenance strategy**
  - Examples of asset segmentation and strategies:
    - Highly critical - scheduled periodic maintenance
    - Critical - scheduled maintenance with condition monitoring
    - Average critical - condition-based maintenance
    - Non-critical - run-to-failure maintenance

- **Balanced assets portfolio**
  - Based on simulation, check equipment load levels against maintenance practices and optimize equipment utilization

- **Optimize maintenance timing and budgets**
  - Update and verify M&R standards, including labour intensity and duration of maintenance operations
  - Draw up detailed unit-by-unit maintenance planning maps

- **Implementation of short-term scheduling and mobile solutions**
  - Integrate maintenance with short-term scheduling and reporting
  - Allocate personnel to maintenance jobs
  - Tracking equipment status and maintenance workers’ performance in real-time

- **Implement proactive approach based on IT solutions**
  - Plan maintenance/asset management based on the monitoring system, data related to outages and their causes, utilization etc.

**Target result**
- **up to 15%**
  - maintenance OPEX reduction

**70%**
- Unscheduled outage reduction
Major Initiative Case Study: Integration of Simulation Technology

**Input data**
- 3D ore mining model using MicroMine
- Mine plan based on software MineSched
- Detailed information, in particular on equipment for 6 mines

**Real-time analysis of production volume increase options**

1. Reduce haulage distance?
2. Reduce shift change break time?
3. Send LHD #5 for maintenance?
4. Bottleneck?
5. Should the speed be increased?
6. Is the route optimal?
7. Adjust operating mode?

**Control**
Execution of detailed KPIs (speed, cycle time etc.)

**Cost reduction**
Due to optimized utilization of the company’s resources
Shared Services Centre to Drive Down G&A Costs

Approach

- Support functions (Accounting, Treasury, HR, IT) to be moved from the Group companies to a the Shared Services Centre (SSC)
- Main SSC hub established in the city of Saratov

Results achieved

- SSC launched in 2015, personnel of HQ and a number of production sites transferred in 2017
- “Best SSC launch in Russia” award received

Cost-cutting target: **USD 40 mln** per annum
- **50%** cost saving for support functions
- **30%** headcount reduction
Efficiency Case Study: Property Insurance

Property insurance costs

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost (RUB mln)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,575</td>
<td>-46%</td>
</tr>
<tr>
<td>2016</td>
<td>858</td>
<td>-11%</td>
</tr>
<tr>
<td>2017</td>
<td>761</td>
<td></td>
</tr>
</tbody>
</table>

- The company has achieved a twofold decrease in its insurance premium in the last 2 years and a cost saving of RUB 814mln (USD 14mln) per annum while maintaining the same terms of coverage.
- Premiums fell on the back of improved placement strategy and in-depth presentation of Nornickel risk to insurance markets.
- 2017 premium savings of 11% achieved despite shaky insurance markets following hurricanes in the US.

- Insurance coverage in line with standards for global diversified miners.
- Risks fully placed with global reinsurers rated A- or higher.
### Cost of Financing Optimization

#### Secondary Eurobond yield curve

<table>
<thead>
<tr>
<th>Yield, %</th>
<th>YE 2015</th>
<th>YE 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Maturity, years

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
</table>

#### Comments

- In 2017 the Company took advantage of the favourable debt capital markets and successfully placed two Eurobonds with a discount to its secondary yield curve.
- Successful placements allowed Nornickel to revisit pricing terms of the bank debt and trade finance instruments in the Company’s portfolio.

<table>
<thead>
<tr>
<th>Action</th>
<th>Details</th>
<th>Interest cost saving effect, per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repricing of bilateral credit lines</td>
<td>Decrease in interest rates and maturity extension of bilateral credit lines</td>
<td>USD 41mln</td>
</tr>
<tr>
<td>Issue of guarantee</td>
<td>Corporate financial guarantee for the amount of USD 800mln issued in favor of Sberbank to secure debt of GRK Bystrinskoye</td>
<td>USD 22mln</td>
</tr>
<tr>
<td>Decrease the share of ruble-denominated debt</td>
<td>Two Eurobonds proceeds partially used to prepay ruble debt (RUB 60bn)</td>
<td>USD 60mln</td>
</tr>
<tr>
<td>Replacement of advance payments with short-term debt</td>
<td>Repayment of advance payments from BASF and Societe Generale in the total amount of USD 650mln</td>
<td>USD 12mln</td>
</tr>
</tbody>
</table>

**Total annual interest cost savings**

USD 135mln
Debt Portfolio Optimization

**Average cost of debt**

<table>
<thead>
<tr>
<th></th>
<th>1Q 2017</th>
<th>2Q 2017</th>
<th>3Q 2017</th>
<th>4Q 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Q 2016</td>
<td>1.0%</td>
<td>1.2%</td>
<td>1.3%</td>
<td>1.4%</td>
</tr>
<tr>
<td>4Q 2016</td>
<td>5.1%</td>
<td>5.3%</td>
<td>5.0%</td>
<td>5.1%</td>
</tr>
<tr>
<td>4Q 2016</td>
<td>5.1%</td>
<td>5.3%</td>
<td>5.0%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

**Optimised debt repayment profile**

<table>
<thead>
<tr>
<th></th>
<th>YE 2016</th>
<th>YE 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>1.9</td>
<td>1.0</td>
</tr>
<tr>
<td>2021</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>2022</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>2023</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Note:** 1. Estimate

- As a result of various debt optimization activities the Company lowered its average cost of debt by 0.53% in 2017 despite the LIBOR increasing by 0.40% during the same period.

- In 2017 the Company extended maturities of debt portfolio and substantially decreased debt repayments in 2018-2019.
The increase in working capital up to USD 2.1bn during 2017 is temporary and is caused by one-off factors and revision of trade finance deals.

The Company expects a return to the 2014-2015 average level of around USD 1.0bn.
Financial Model Going Forward

Net Debt / EBITDA

Possible range = 1.5x-2.5x depending on metals prices

Expected range

Leverage increase will be capped by:
- Working capital release
- Lower dividend payout in accordance with dividend target formula
- Capex management

In case of improved market environment, dividend payouts will stay at 60% EBITDA, allowing the company to maintain efficient capital structure
Norilsk Credit Ratings: Credit Metrics at Investment Grade Level

### S&P Global

- **BBB- / outlook Stable**
  - On October 27, 2017 S&P Global Ratings revised its outlook on the Company’s rating to Stable from Negative and affirmed “BBB-“ corporate credit rating
  - Nornickel’s corporate credit rating is one notch above the sovereign rating reflecting S&P view that the Company’s profile is supported by its leading positions in global metal markets

### Moody’s

- **Ba1 / outlook Stable**
  - On February 21, 2017 Moody’s revised its outlook to Stable from Negative and affirmed “Ba1” corporate credit rating of Nornickel, following the change in the outlook for Russia’s government bond rating
  - Fundamentally, Moody’s are of the opinion that stand-alone credit quality of the Company exceeds the Ba1 rating criteria but the rating remains constrained by Russia’s sovereign rating

### Fitch Ratings

- **BBB- / outlook Stable**
  - On October 18, 2017 Fitch Ratings affirmed Nornickel credit rating at “BBB-“ with Stable Outlook
  - Fitch estimates the Company’s stand-alone credit rating at “BBB+“ and applies a two-notch discount to account for political, business and regulatory risks in Russia
Sensitivities to USD/RUB Exchange Rate

At the USD/RUB rate of 59.1, 1% change in exchange rate translates into:

- EBITDA change of USD 36mln, FCF of USD 56mln

Currency break up of OPEX:

- Non-RUB: 25% (1H 2016), 15% (1H 2017)
- RUB: 75% (1H 2016), 85% (1H 2017)

Currency break up of CAPEX:

- Non-RUB: 28% (1H 2016), 22% (1H 2017)
- RUB: 72% (1H 2016), 78% (1H 2017)
Metals Markets Outlook

**Metal**

<table>
<thead>
<tr>
<th>Metal</th>
<th>Ni</th>
<th>Pd</th>
<th>Pt</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-exchange</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan-16</td>
<td>89</td>
<td>84</td>
<td>112</td>
<td>240</td>
</tr>
<tr>
<td>Dec-17</td>
<td>77</td>
<td>55</td>
<td>124</td>
<td></td>
</tr>
</tbody>
</table>

**Stocks, days of consumption**

- **Ni**: Deficit (2017E - 2016)
- **Pd**: Deficit (2017E - 2016)
- **Pt**: Balanced (2017E - 2016)
- **Cu**: Balanced (2017E - 2016)

**Market Balance Forecast**

- **Ni**: Deficit (2017E - 2016)
- **Pd**: Deficit (2017E - 2016)
- **Pt**: Balanced (2017E - 2016)
- **Cu**: Balanced (2017E - 2016)

**Medium-term Fundamentals**

- **Ni**: Down
- **Pd**: Up
- **Pt**: Up
- **Cu**: Up

**Long-term Fundamentals**

- **Ni**: Up
- **Pd**: Up
- **Pt**: Up
- **Cu**: Up

Source: Company data

Note: 1. Change in ETFs in January’16 – October’17, 2. Including ETFs, investment demand and industry stocks movement
Nickel Market Short-Term Outlook

Nickel Market: Deficit Expected to Reduce in 2018 Due to Production Growth in Indonesia and the Philippines

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>19</td>
<td>-90</td>
<td>228</td>
<td>-14 kt</td>
<td>152</td>
<td></td>
</tr>
</tbody>
</table>

-2016: 107
-2017E: 19
-2018: 152

Ni Supply: Increase Driven by Return of Indonesia to Ore Export Markets and Philippines Recovery

<table>
<thead>
<tr>
<th>2016</th>
<th>2017E</th>
<th>2018E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 004</td>
<td>2 023</td>
<td>2 251</td>
</tr>
</tbody>
</table>

Kt

Source: Company data

Strong Growth of Ni Demand in Stainless Steel Expected in 2018E Across All Key Regions

<table>
<thead>
<tr>
<th>2016</th>
<th>2017</th>
<th>2018E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 005</td>
<td>2 112</td>
<td>2 265</td>
</tr>
</tbody>
</table>
Rising Ore Supplies from the Philippines and Indonesia

Nickel Ore Supply to China Recovering in 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Philippines</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>71</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>48</td>
<td>76%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>35</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>32</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>9M2017</td>
<td>35</td>
<td>85%</td>
<td></td>
</tr>
</tbody>
</table>

Y-o-Y
-33% -26% -9% +8%

NPI Supply from China & Indonesia Expected to Grow

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>508</td>
<td>33%</td>
</tr>
<tr>
<td>2014</td>
<td>489</td>
<td>26%</td>
</tr>
<tr>
<td>2015</td>
<td>386</td>
<td>9%</td>
</tr>
<tr>
<td>2016</td>
<td>366</td>
<td>+8%</td>
</tr>
<tr>
<td>2017E</td>
<td>391</td>
<td>85%</td>
</tr>
<tr>
<td>2018E</td>
<td>500</td>
<td>100%</td>
</tr>
</tbody>
</table>

Ni Ore Export from Indonesia Has Resumed: YTD 12 Licenses Have Been Granted

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, quota issued, Mln (wmt)</th>
<th>Ni units, quota issued, Kt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>2017E</td>
<td>78</td>
<td>208</td>
</tr>
</tbody>
</table>

Source: Company data, Chinese customs trade statistics
Nickel Cost Curve - Limited Price Sensitive Production

Little Supply Rationalization Shown in 2014-2017 Downturn...

...As Most of High-Cost Producers Not Price-Sensitive

Source: Company data, Wood Mackenzie
Note: 1. Including nickel ore by-product value for NPI and synergy from integration with stainless steel production
Long-Term Global Nickel Supply: Growth Driven by Laterite Ores

Laterite Ores Expected to be the Main Source of New Nickel Units Growth in Long-Term

Underinvestments Impacting Ni Production from Sulphide Ores

Source: Company data, Wood Mackenzie
Production of Battery Grade Nickel

Status Quo

1. HPAL ➔ Hydroxide Ni \(^{(1)}\) ➔ Refinery 40Kt
2. HPAL ➔ Ni Sulphide
3. Integrated Producer ➔ Ni Refinery 25Kt
4. Scrap ➔ Ni Refinery 10Kt
5. Copper Stream 20Kt
6. Heap Leaching 20Kt

Possible/Balancing Option

1. Briquettes 15Kt
2. Cathodes

Product

- Ni Sulfate 130Kt
- Battery 70Kt
- Other applications: 60Kt

Applications:
- Precursor
- Cathode Material
- Battery
- Other applications:
  - Plating
  - Chemicals

Source: Company data 2017
Note: 1. MHP used in batteries production.
Nickel Feed Status Quo: Excess Nickel Class 1 Availability

Source of Ore

<table>
<thead>
<tr>
<th>Source of Ore</th>
<th>Ni units, Mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suphide Ore</td>
<td>0.8</td>
</tr>
<tr>
<td>HPAL/Laterite</td>
<td>0.2</td>
</tr>
<tr>
<td>Laterite Ore</td>
<td>1.0</td>
</tr>
</tbody>
</table>

2016 Production/Consumption Flow

<table>
<thead>
<tr>
<th>Ni Products</th>
<th>Ni Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
</tbody>
</table>

Class 1 Ni

<table>
<thead>
<tr>
<th>Ni Products</th>
<th>Ni Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathode/Briqs/Special Forms (Ni 99.9%)</td>
<td>0.9</td>
</tr>
<tr>
<td>NiS04 (Ni 20%)</td>
<td>0.1</td>
</tr>
<tr>
<td>Other</td>
<td>0.2</td>
</tr>
<tr>
<td>NPI (Ni 8-12%)</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Substitution potential

Class 2 Ni

<table>
<thead>
<tr>
<th>Ni Products</th>
<th>Ni Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fe-Ni (Ni 40-60%)</td>
<td>0.4</td>
</tr>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
<tr>
<td>Ni Feed</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company data
Long-Term Nickel Demand Outlook: Base Case Scenario Suggests Enough Class 1 Feed Until 2022E

Source: Company estimates
Capital Intensity: Higher Ni Prices are Required in the Long Run to Incentivize Additional Supply After 2023E

**Reduction of Capital Intensity and Incentive Price Driven by Class2 Projects (NPI)**

<table>
<thead>
<tr>
<th>Capex, '000 USD/t</th>
<th>Incentive price, '000 USD/t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2008</strong></td>
<td></td>
</tr>
<tr>
<td>PAL/HPAL</td>
<td>50K -110K USD/t</td>
</tr>
<tr>
<td>NPI</td>
<td>25K USD/t</td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td></td>
</tr>
<tr>
<td>NPI</td>
<td>5K-15K USD/t</td>
</tr>
<tr>
<td>NPI</td>
<td>18K USD/t</td>
</tr>
</tbody>
</table>

**Indicative Full Cash Costs of NiSO4: Prohibitive for All But Class 1 Products**

- **NPI conversion**
- **Fe-Ni**
- **HPAL MHP**
- **Briquettes**

**Source:** Company data, Wood Mackenzie
Copper Short-Term Outlook: Growth of Supply in Line with Consumption

Global Refined Production Will Remain Almost Stable in Short-term

<table>
<thead>
<tr>
<th>Year</th>
<th>Mt</th>
<th>Y-o-Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>2017E</td>
<td>22.5</td>
<td>+1%</td>
</tr>
<tr>
<td>2018E</td>
<td>22.8</td>
<td>+2%</td>
</tr>
</tbody>
</table>

China Remains the Main Driver of Global Copper Consumption Growth in 2017-2018E

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Other</th>
<th>yt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>0.2</td>
<td>0.1</td>
<td>22.5</td>
</tr>
<tr>
<td>2017E</td>
<td>22.8</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>2018E</td>
<td>23.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Company data, Bloomberg
Copper Market Long-Term Outlook: Risk of Overestimating Demand

Copper Supply: Bottom Up 3Mt to be Added by 2025E

<table>
<thead>
<tr>
<th>Mt</th>
<th>New copper production 2017-2025E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>22.8</td>
</tr>
<tr>
<td>New projects</td>
<td>2.5</td>
</tr>
<tr>
<td>Increase in current production</td>
<td>1.8</td>
</tr>
<tr>
<td>Probable projects</td>
<td>1.8</td>
</tr>
<tr>
<td>Production losses</td>
<td>-3.0</td>
</tr>
<tr>
<td>2025E</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Long-Term Copper Forecasts: Since 2012 the Demand Outlook for 2025 Reduced by 6Mt, but Supply Forecast Raised by 3Mt

<table>
<thead>
<tr>
<th>Mt</th>
<th>Change in forecasts of 2017 vs. 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>-6</td>
</tr>
<tr>
<td>Supply</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Company data, Wood Mackenzie
PGM Supply and Demand Balances: Divergent Fundamentals for Pt and Pd in the Medium-Term

Global Palladium Market: Major Structural Deficit to Persist in 2017-2020E

Global Platinum Market: Structural Deficit Has Evaporated on Weaker Demand

Source: Company data
Premium of Palladium to Platinum is Sustainable in the Mid-Term

Palladium Discount to Platinum Has Been Eliminated on Fundamentals…

… as Platinum Has Been Loosing its Market Share in Autocatalysts to Palladium

Source: Company data

**Pt**: Diesel substitution, hybridization, China 6 introduction

**Pd**: Substantial time lag >2Y for change in technology. Low jewellery demand in China
Why 2017 is Not 2001 For Palladium

Current Palladium Premium to Platinum is Fundamentally Justified...

... As Much Has Changed Since 2001

<table>
<thead>
<tr>
<th>2001</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term market squeeze, government</td>
<td>Sustained long-term market deficit</td>
</tr>
<tr>
<td>action</td>
<td></td>
</tr>
<tr>
<td>Concerns over Pd supply from Russia</td>
<td></td>
</tr>
<tr>
<td>Major Russian government stockpiles</td>
<td></td>
</tr>
<tr>
<td>stockpiles overhang</td>
<td></td>
</tr>
<tr>
<td>Substitution Pt/Pd ratio 1:2</td>
<td></td>
</tr>
<tr>
<td>Thrifting away from Pd-intensive</td>
<td></td>
</tr>
<tr>
<td>gasoline, roll out of Pt-intensive</td>
<td></td>
</tr>
<tr>
<td>diesels</td>
<td></td>
</tr>
<tr>
<td>Meeting CO\textsubscript{2} 2021 targets:</td>
<td></td>
</tr>
<tr>
<td>Pd-intensive hybridization is the only</td>
<td></td>
</tr>
<tr>
<td>option</td>
<td></td>
</tr>
<tr>
<td>Extensive Pd loadings – room for</td>
<td></td>
</tr>
<tr>
<td>optimization</td>
<td></td>
</tr>
<tr>
<td>Optimized loadings – little room for</td>
<td></td>
</tr>
<tr>
<td>optimization</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company data
PGM Global Supply: Limited Growth in the Medium Term

Little Growth Expected in Primary Supply: 1.3% and 2.0% p.a. of Global Pd and Pt Output, Respectively

PGM Capex Rationalization in South Africa is Not Supportive for Production Growth

Change in production 2013-2016

2017-2020E

Downside risk prevails

Source: Company data
Note: 1. Cumulative capex of Amplats, Impala, Lonmin and Northam
Recycling Growth Will Not be Able to Balance the Market as it Lags Behind Pd Demand

Growth of Recycled Palladium Supply to Moderate Considerably...

...as Vehicles With High Palladium Loadings Have Been Mostly Recycled by 2015

It Takes 10-12 Years for Vehicles to Come for Recycling

Source: Company estimates;
<table>
<thead>
<tr>
<th>Key Trends</th>
<th>Demand Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Sustainable automotive production growth globally</td>
<td>PGM</td>
</tr>
<tr>
<td>2  Diesel substitution by gasoline vehicles in Europe</td>
<td>Pd  Pt</td>
</tr>
<tr>
<td>3  Growth of hybrid vehicle market share worldwide</td>
<td>Pd</td>
</tr>
<tr>
<td>4  Growth of SUV market share and increase in engine size</td>
<td>PGM</td>
</tr>
<tr>
<td>5  Strengthening emissions legislation worldwide</td>
<td>PGM</td>
</tr>
<tr>
<td>6  Electric vehicles/batteries worldwide</td>
<td>Ni  PGM</td>
</tr>
</tbody>
</table>
Legislative Stimulus of Transport Electrification

New Regulations, Especially in China, Push Automakers to Increase PGM Loadings

Comparison of NMOG/NMHC+NOx emission requirements in China, the European Union and the USA during 1990-2025E

Policy Incentives for the Adoption of Electric Vehicles and Announced Restrictions on ICEs

<table>
<thead>
<tr>
<th>Country</th>
<th>Policy Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria, Denmark, Ireland,</td>
<td>No ban on ICE, but EV targets set</td>
</tr>
<tr>
<td>Netherlands, Portugal, Spain,</td>
<td></td>
</tr>
<tr>
<td>Japan, South Korea</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>Several states have announced transition to BEVs</td>
</tr>
<tr>
<td>China</td>
<td>Ban on ICE cars sales - deadline to be determined</td>
</tr>
<tr>
<td>Germany</td>
<td>Ban on ICE car sales might be considered</td>
</tr>
<tr>
<td>Scotland/France/UK</td>
<td>Ban on ICE cars sales by 2032/2040/2040</td>
</tr>
<tr>
<td>Netherlands/Norway</td>
<td>Zero-emission program by 2025</td>
</tr>
</tbody>
</table>

EU: penalty EUR95/gr for exceeding the limits of 95gr. CO2/km from 2021 (Limit -30% by 2030)

Source: Company data, ICCT, LMC Automotive, Thomson Reuters, ACEA, Wards-Auto, CAAM
Note: 1. ICE – internal combustion engine;
Growing Autos Production - Long Term Trend

Global Light Vehicles Production Growth
Drivers: Hybrids, BEVs+PHEVs and Gasoline

Consensus is Bullish on Long-Term Outlook of Electric Vehicles Sales, but Estimates Vary Greatly

<table>
<thead>
<tr>
<th>Mln units</th>
<th>2016</th>
<th>2020E</th>
<th>2025E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>71</td>
<td>72</td>
<td>76</td>
</tr>
<tr>
<td>Diesel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrids</td>
<td>18</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>BEV</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>PHEV+HEV</td>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Source: Company data, LMC Automotive, Market Research
Note: 1. EV includes BEV, PHEV and other hybrids vehicles;
Automakers Announced the Transition to All Types of Electric Vehicles, but Not Just Battery Electric Vehicles

Most Automakers Announced the Move to Electric Cars...

<table>
<thead>
<tr>
<th>Mln units per year</th>
<th>Announced date of full model range electrification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JLR</strong></td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Daimler</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>VW</strong></td>
<td>10</td>
</tr>
</tbody>
</table>

... and Many of Them to be Hybrids

<table>
<thead>
<tr>
<th>Model range</th>
<th>Electric</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMW</td>
<td>13</td>
<td>50</td>
</tr>
<tr>
<td>VW Group</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Renault</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Hyundai Motors &amp; Kia Motors</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Due to higher manufacturing cost of xEV mass vehicle producers are in no rush to accelerate xEV production

"...15-20% of sales as EV by 2025E", Daimler company representative

"...70% of Ford brand to be conventional hybrids, plug-in hybrids or full battery electric by 2025", Ford company representative

Source: Company data, IHS, LMC Automotive
BEVs and PHEVs: Growing Reliance on Ni

NCA&NCM are Main Cathode Types

Higher Ni Intensity in NCM Cathodes Driven by Higher Energy Density and Co Substitution

- **NCM 1:1:1**: 2015
- **NCM 6:2:2**: <2020
- **NCM 8:1:1**: >2020

Mainstream NCM Chemistry

Ni weight content in cathode material Li(NiCoMn)O2

- **20%**: Low energy density
- **36%**: Improve energy density by increasing Ni from 30% to 80%
- **48%**: Adopted by Tesla and Panasonic
- **24%**: Mainly used for consumer electronic components

Source: Company data
Norilsk Nickel’s Metal Basket Content by Light Vehicle Type

<table>
<thead>
<tr>
<th></th>
<th>Gasoline</th>
<th>Diesel</th>
<th>Hybrid incl. PHEV</th>
<th>BEV</th>
<th>FCEV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAGR</strong></td>
<td>+1%</td>
<td>+1%</td>
<td>+18%</td>
<td>+25%</td>
<td>+41%</td>
</tr>
<tr>
<td><strong>Market Share</strong></td>
<td>68%</td>
<td>17%</td>
<td>9%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Ni</strong></td>
<td>3-4 kg</td>
<td>3-4 kg</td>
<td>5-15 kg</td>
<td>30-110 kg</td>
<td>2-3 kg</td>
</tr>
<tr>
<td><strong>Cu</strong></td>
<td>20-25 kg</td>
<td>20-25 kg</td>
<td>45-50 kg</td>
<td>75-80 kg</td>
<td>70-75 kg</td>
</tr>
<tr>
<td><strong>PGM</strong></td>
<td>2-5 g</td>
<td>3-6 g</td>
<td>2-6 g</td>
<td>-</td>
<td>25-35 g</td>
</tr>
<tr>
<td>Pt:Pd ratio</td>
<td>1:4</td>
<td>8:1</td>
<td>1:4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal value per vehicle, USD (4)</td>
<td>$260-410</td>
<td>$270-410</td>
<td>$440-710</td>
<td>Up to $1,830</td>
<td>Up to $1,600</td>
</tr>
</tbody>
</table>

**Source:** Company estimates, LMC Automotive, Bloomberg;  
**Note:** 1. CAGR for 2015-2025E, 2. Expected market share in 2025 based on production; 3. Excluding additional infrastructure demand of 1-8 kg per charger; 4. Metal values calculated at spot prices as of November 16, 2017.
## Autos Driven Metals Demand Outlook by 2025E

### Metal

<table>
<thead>
<tr>
<th>Metal</th>
<th>PGMs</th>
<th>Ni</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.7</td>
<td>3.1</td>
<td>64</td>
</tr>
</tbody>
</table>

**PGMs**
- Moz: 1.7 Kt
  - Gasoline: 1.0 Kt
  - Hybrids: 0.3 Kt
  - PHEV: 0.1 Kt

**Ni**
- BEV: 310 Kt
  - Ni in batteries: 111 Kt
  - Ni in stainless steel, alloys and parts: 15 Kt
  - Diesel: 5 Kt
  - Total: 441 Kt

**Cu**
- Charging stations inc PHEV: 390 Kt
  - Cu in electric engines and generators: 534 Kt
  - BEV: 205 Kt
  - Diesel: 143 Kt
  - Total: 1,272 Kt

**Consumption**
- Gasoline
- Hybrids
- PHEV
- Diesel
- Total

**Note:** 1. Assuming additional 16 mln units of light vehicle sales.
# Nickel Strategy with Focus on Sales Diversification

## Ni sales strategy priorities

- **Balanced portfolio between STS and non-STSS sectors**
- **Efficient use of built-in flexibility at Harjavalta Refinery to produce different forms: briquettes, powders, sulfate**
- **Support of EV revolution**

## Progress up-to-date

<table>
<thead>
<tr>
<th></th>
<th>Sales to Non-STS users, Kt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>79</td>
</tr>
<tr>
<td>2017E</td>
<td>104</td>
</tr>
<tr>
<td>+32%</td>
<td></td>
</tr>
</tbody>
</table>

## Sales team focus

- **Alloys & Special Steels:** increased sales in China and Russia as a result of focused marketing efforts
- **Plating:** expanded commercial capabilities and presence in China; optimised product offering and intensified customer education
- **Batteries:** active engagement with leading players in the sector *(more details on the next slides)*

- Insight into technical needs of consumers in added-value uses gained through captive Technical Analysis & Research Team
- CAPEX-light initiatives to better address Non-STS customers’ needs
- Focused targeting of Non-STS customers
## Preferred Product Mix for Battery Sector

<table>
<thead>
<tr>
<th>Products</th>
<th>Progress to date</th>
<th>Growth options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfate</td>
<td>• Benchmark quality product</td>
<td>Flexible product offering to address evolving market needs</td>
</tr>
<tr>
<td></td>
<td>• Production in 2017 close to maximum capacity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Immediate access to battery sector</td>
<td></td>
</tr>
<tr>
<td>Briquette</td>
<td>• Pro-active marketing of NN briquettes (historically supplied to Stainless consumers) to battery / precursor producers</td>
<td></td>
</tr>
<tr>
<td>Powder</td>
<td>• Debottlenecking packaging capacity and extending the range of packaging options – response to strong demand increase from battery raw material sector</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Customized offering in terms of different size fractions</td>
<td></td>
</tr>
<tr>
<td>Solutions</td>
<td>• A ready-to-use chemical for downstream</td>
<td></td>
</tr>
</tbody>
</table>

- **NN Harjavalta** represents a unique supply proposition for battery / precursor manufacturers due to flexibility and optionality of the refining process.

- Capex-light development of customer-tailored product portfolio for battery raw material sector.
Strategic View on Battery Sector

Mid-term

- Leveraging Harjavalta product mix - sulphate, powder, briquettes (complemented by cobalt products) - to address consumer preferences
- In-depth understanding of the future requirements by PCAM(1) producers both for quality and volume of feed will allow to avoid unnecessary excessive CAPEX
- Strategic alliances with precursor manufacturers, JVs considered

Long-term

- CAPEX to increase capacity of products designated for battery sector as a function of demand dynamics
- A strong and competitive stance as supplier to batteries sector
- Scaling up cooperation with leading precursor producers / developers

Potential expansion in line with demand

The current market sentiment runs well ahead of actual demand from EVs
Sales to follow the actual pace of battery market evolution

Note: 1. Precursor for cathode active material
Strong Indication of Pd Market Tightening in 2017

Pd Market in Consistent Backwardation since April 2017

Limited Availability of Physical Pd in the Spot Market

Destocking from Visible Vaults Continuing ...

... Above-ground Stocks Lack Transparency

100%=01.01.2015

GPF makes non-transparent stocks available for industrial users

MOz
**Mid-term**

- Stock support / physical availability management to support industrial demand by providing a supply bridge over mid-term deficit
- Prioritization of sales to industrial clients with primary focus on auto industry to ensure sustainability of supply
- Global Palladium Fund as a channel to supply industrial clients with formerly stockpiled metal

**Long-term**

- Strategic aspiration for PGM production growth
- Strong portfolio of “PGM-rich” growth opportunities that could fill most of the potential deficit in the long run:
  - South Cluster (almost 70% of potential production could be PGMs)
  - Talnakh capacity expansion
  - Maslovskoye deposit (30+ MOz of Pd in resources)
  - Potential cooperation with license-holders of PGM-rich deposits
Palladium Fund Status And Priorities

Global Pd fund

Goals

- To access previously unavailable stocks in order to channel them to anchor industrial consumers when needed
- To facilitate the metal flow to industrial consumers rather than speculators

Milestones

- 2016 - Fund established
- Mid-2017 – Fully operational: team, accounts, trade lines and contracts in place
- 2H2017 - Stockpile accumulation

Fund as a tool of creating a “supply bridge” over anticipated mid-term deficit in 2018-2020

Decision to create a physical stockpile of Palladium to support mid-term demand from anchor consumers in response to palladium physical market tightening

- **Expected size**: up to 0.6 MOz
- **Product range**: mixture of purchased 3rd party and NN material in order to match industrial customers’ requirements for metal form (ingot or sponge)
- **Delivery schedule**: subject to production plans of anchor industrial clients
- **Proper risk-management procedures** to limit price exposure
Sustainable Development

Andrei Bougrov
Deputy Chairman of the Board
Senior Vice-President
Comprehensive Approach to Sustainable Development – Board Leadership

Strong Corporate Governance:
- Independent Board Chairman
- Strong Board Committees and stringent governance procedures
- Dedicated Audit and Sustainable Development Board Committee

Progress in Implementation of Environmental Roadmap:
- Phase 1 of environmental program completed in 2017
- 2016 SO\(_2\) emission reduction: 5% in Polar Division and 23% in Kola Division
- Phase 2 launched: Sulphur project. Target SO\(_2\) reduction 75% by 2023

Improving Health & Safety – on Top of Management Priorities:
- Significantly improved LTIFR: reduced by 59% in 2013-2016; Below global industry average
- Independent verification of health & safety practices by DuPont Assessment: occupational safety culture score improved from 1.4 in 2013 to 2.5 in 2016
- Long-term target: zero-fatality on production sites

Sustainable Development of Territories:
- Support of social initiatives in the regions of operations
- Housing and reallocation programs («Our home», «My home») and other social programs (World of New Opportunities)
- Wider community engagement
- Participation in federal social programs
- Long-term social agreement with the government of Zabaikalsky Krai – a new region of operation
Balanced Board of Directors

Board of Directors consists of 13 members (incl. 2 executive)

5 Independent Directors

4 Directors

4 Directors

- Audit and Sustainable Development Committee chaired by independent director
- Strategy Committee chaired by Rusal representative
- Budget Committee chaired by Interros representative
- CG, Nomination and Remuneration Committee chaired by independent director

Gareth Peter Penny
Non-Executive Independent Chairman
- 22 years of mining experience with De Beers and Anglo American
- CEO of De Beers 2006-2010
- Non-executive Board member of Julius Baer Holdings Limited

Source: Norilsk Nickel
Note: 1. Including Chairman of the Board of Directors. In accordance with the criteria set out in the Russian Federal law “On Joint Stock Companies” No. 208-FZ dated 26 December 1995, as amended, and the Company’s own criteria, which differ in certain respects from the criteria for independent directors that are set out in the U.K. Corporate Governance Code.
Selected Environmental Initiatives: Cleaning Up Legacy Issues (1/2)

- Annual **Eco marathon supported by World Wildlife Fund (WWF) and UN Environment** at Polar and Kola divisions **included 70 ecological campaigns in 2017**
- Over **1,000 trees** and shrubs **planted** by company volunteers

**Environmental Clean Up Campaign at Kola Bay**

**Tree Planting Program in Polar and Kola Divisions**

Source: Company data
Selected Environmental Initiatives: Cleaning Up Legacy Issues (2/2)

Environmental Clean Up in Norilsk: Environmental Monitoring in the Area of Daldykan River

Improving Biodiversity in Norilsk: Releasing Juvenile Fish into the River

Source: Company data
Sustainable Development of Territories

Norilsk Airport Runway Infrastructure Reconstruction

High-Speed Internet Access to Norilsk: New 1,000 km Fiber-Optic Line

Long-Term Social Agreement with the Government of Zabaikalsky Krai

Relocation Programs for Employees: Our Home and My Home Programs

Source: Company data
Norilsk Nickel ESG Initiatives Getting Traction with Investors and NGOs

90% of investors appreciate Norilsk Nickel ESG Activities (1)

«We find the board and senior management open and willing to discuss issues with shareholders...»

*Major UK institutional investor*

«The company has made significant progress in improving ESG management... the company has increased initiatives to reduce pollution...The obsolete and highly pollutant Nickel Plant was shut down in 2016»

*Sustainalytics Report, 2017*

«The sulfur capture program is the most significant ESG initiative»

*Major UK institutional investor*

«The company is now showing that it is doing a lot with regard to investments in modernization and in developing its production...»

*The Independent Barents Observer*

«...Over the past years, we have heard many promises from the company. But now, if Potanin says so and if they will really allocate so much money it should result in an emissions cut...»

*Bellona Foundation*

Source: Company data, IPREO;
Note: 1. Based on independent IPREO survey of investors and analysts as of April 2017;
**Gradual Improvement of Norilsk Nickel ESG Assessment**

Norilsk Nickel efforts to improve its ESG track record starting to be recognized

Norilsk Nickel Sustainalytics ESG Score increased from 46 to 58 points (out of 100)...

*Average (1)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Global Ranking</th>
<th>Opinion/View</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>58</td>
<td></td>
</tr>
</tbody>
</table>

... as Well as the Relative Position vs. Global Peers

- In November 2016, the Company joined the United Nations Global Compact
- Improved ESG score by Sustainalytics Agency
- In December 2016, Nornickel was confirmed as a FTSE4Good Emerging Index constituent
- 4th place (out of 33) in the first ranking of environmental performance of mining companies in Russia by WWF (2)
- Environmental management in compliance with international standards ISO 14001:2004

Note: 1. Average for the metals and mining industry according to Sustainalytics Research, 2. Held by the WW Fund the Ministry of Natural Resources and Environment of Russian Federation;
ESG Ratings Bear Certain Controversy

- High degree of subjectivity in assigning an ESG rating due to subject matter
- Anonymity of the report = No responsibility over assessment score and conclusions
- Opaque review procedure
- Fact checking against publicly available sources and use of outdated information
- Direct engagement with management – not a rule

Assessment

“The majority of Norilsk Nickel employees are based in Russia, where risks of labor-related work stoppages (e.g. strikes and lockouts) and unrest are high, according to the International Labor Organization”

Fact

Total Number of Strikes and Lockouts for the Period 2006–2016, Days

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>24</td>
</tr>
<tr>
<td>USA</td>
<td>154</td>
</tr>
<tr>
<td>Australia</td>
<td>443</td>
</tr>
<tr>
<td>South Africa</td>
<td>863</td>
</tr>
<tr>
<td>Canada</td>
<td>1,863</td>
</tr>
</tbody>
</table>

World’s Median

Norilsk Nickel has comparatively low salaries

Average Monthly Salary

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Monthly Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norilsk Nickel</td>
<td>1.5 '000 USD</td>
</tr>
<tr>
<td>Industry Average in Russia</td>
<td>0.8 '000 USD</td>
</tr>
</tbody>
</table>
Proactive ESG Strategy

1. Internal Policies and Commitments
   - Policies approved by the Board: Human Rights Policy, Freedom of Association Policy, Equal Opportunities Programme, Working Conditions Policy, Anti-Corruption Policy, New Ecology Program
   - Risk assessment programs - 37 internal audits of Occupational Safety and Health management system conducted in 2016
   - Compliance of CSR Report with GRI-4 Sustainability Guidelines
   - Roll out of various Health and Safety standards, such as «Work at height», «Isolation of energy sources», «Transport and pedestrians» and others

2. External communication of Commitment
   - Norilsk Nickel joined the United Nations Global Compact
   - Included in FTSE4Good Emerging Index in 2016
   - Active engagement with leading ESG rating agencies and investors

3. Improved ESG Communications
   - Improved ESG disclose in 2015-2016
   - New ESG section on the corporate web site with improved disclosure
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Head of Investor Relations Department
MMC Norilsk Nickel
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