

Sweden's basic industries Processing of our raw materials

How to streamline with IoT and embedded systems

- Facts and figures
- About ProcessIT Innovations
- Thoughts on IoT and process automation's potential
- Expectations from IoT
- The way forward

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Process automation in Sweden

The process industry

Production value:	SEK 781,000 million (15.5% of the business sector)
Net investments:	SEK 73,000 million (23.5% of the business sector)
Export value:	SEK 425,000 million (42.6% of the business sector)
Represents 13% of Sweden's GDP	

Sales in supplier industries

Automation industry:	SEK 50,000 million
Machinery industry:	SEK 97,000 million
Engineering:	SEK 36,000 million
IT consultancy:	SEK 41,000 million
Total:	SEK 231,000 million

The global automation market
EUR 188 billion in next five years

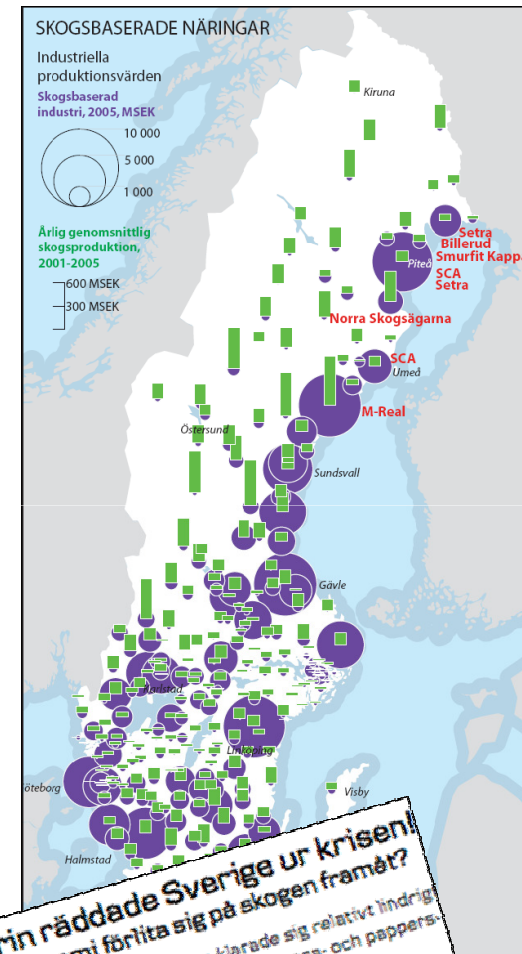
The mining industry in Sweden – Energy

- LKAB
 - Number one **industry investor** in Sweden 2010
 - Invests **SEK 5,000-6,000 million annually**
 - The **biggest automation project** since 2000 in Sweden
Supplier: Midroc Automation – concentration plant in Kiruna
- Boliden
 - Investments in **Garpenberg**: SEK 3,900 million (2012-2013)
 - **17%** of total cost is energy
 - **Recycling** of electronics – from 45 KTon to 120 KTon
- Northland Resources
 - The **biggest greenfield** project in Sweden
 - Estimated **1,000** people needed to **build** the mine and concentration plant
 - **Orders** on the complete production until **2020**
 - Among suppliers, order to Metso worth SEK 1,200 million
- Energy/electricity
 - LKAB: from 2.2 to **2.8 TWh/year electricity** 2010
 - Boliden: 3.7 TWh 2010 (**72%** of all energy is electricity)
 - Energy use 2011: 384 TWh (est.)
Industry 36%, transport 25%, service and building 38%
 - Energy in industry (2008)
50% pulp & paper, 15% iron & steel, 8% chemicals, 3% mining

Significance of the forest industry

- Constitutes 10-12% of the industry's employment, processing, export etc.
- Exports valued at SEK 123 billion in 2009
- Small import of inputs → major contribution to trade balance
- Directly employs 70,000 people and about 200,000 indirectly
- Invests SEK 10 billion per year on average
- High-tech processes
- World-leading exporter
- Lowest CO₂ emissions per tonne (paper & pulp) in the world

Source: Swedish Forest Industries Federation and TVA documentation



Skogsindustrin räddade Sverige ur krisen!
Men kan svensk ekonomi förlita sig på skogen framåt?

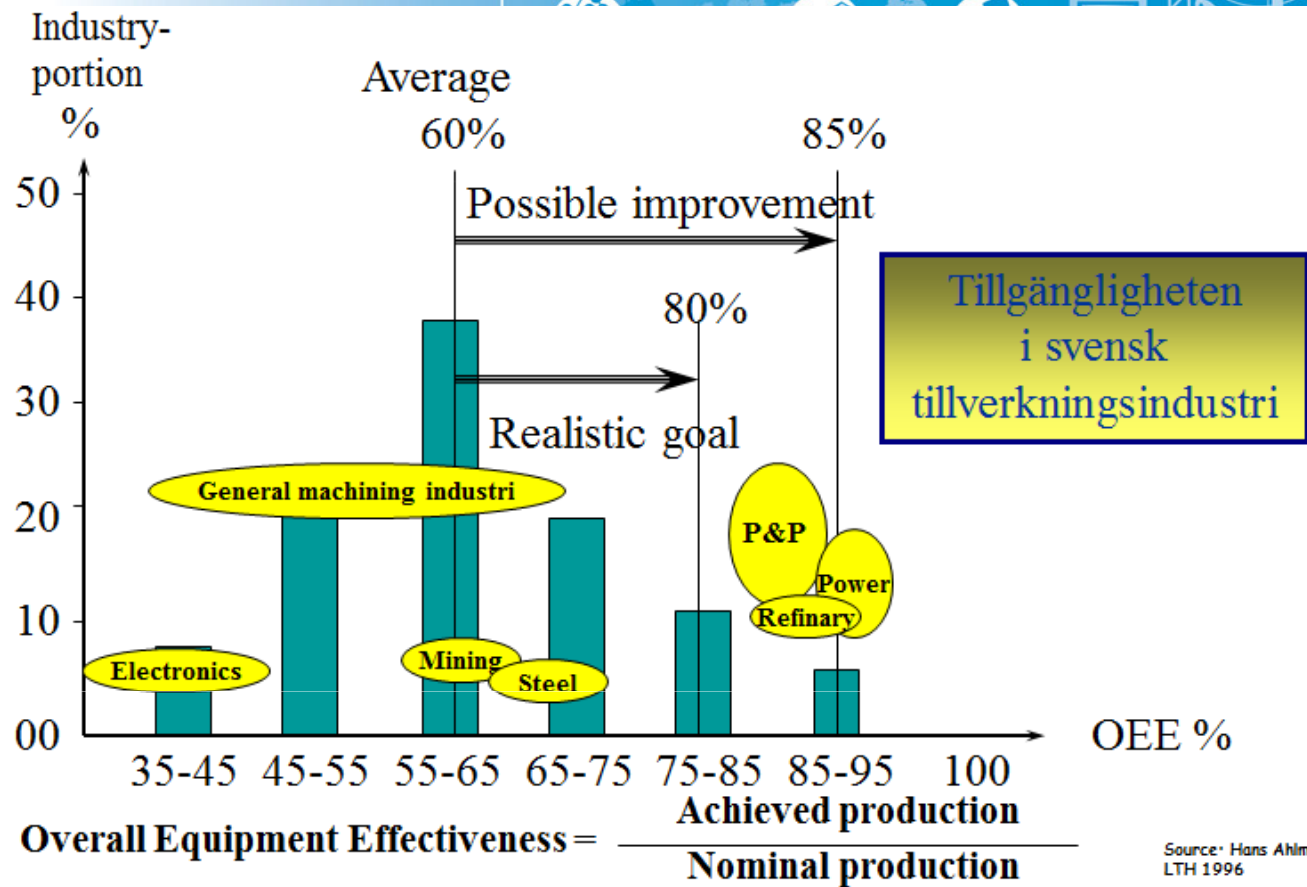
Sverige är ett av få länder i västvärlden som klarade sig relativt lindrigt undan finanskrisen. Det var skogen med sågverk, massa- och pappersindustri som, med hjälp av en svag krona, till sin största del räddade Sverige.

Danske Bank

Investing in your future



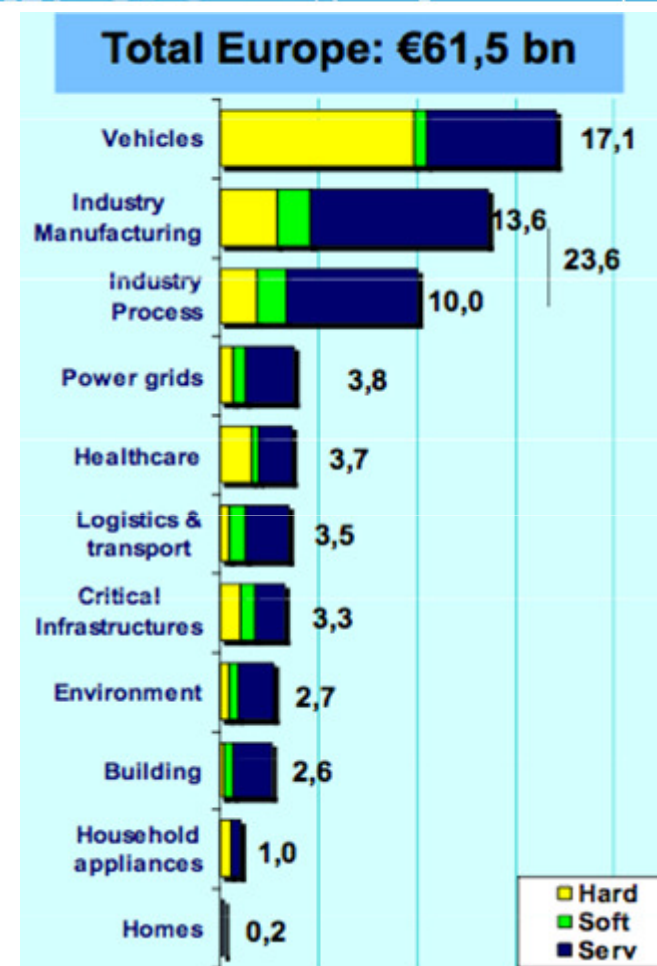
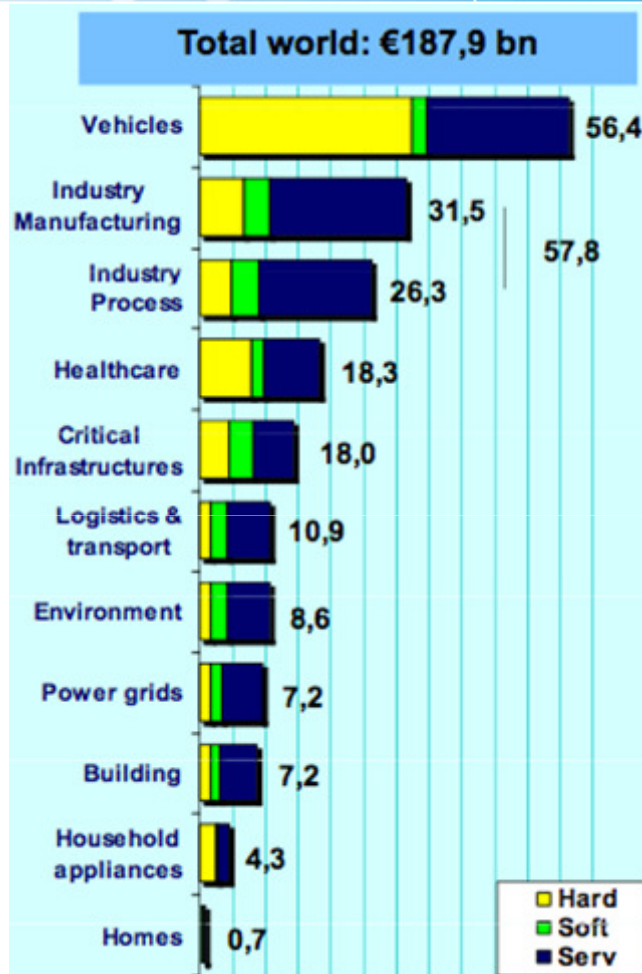
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GROSS PROFIT POTENTIAL 171/105 => +160%

Forecast based on figures from Confederation of Swedish Enterprise, 1999

Worldwide & European monitor & control market



Source:



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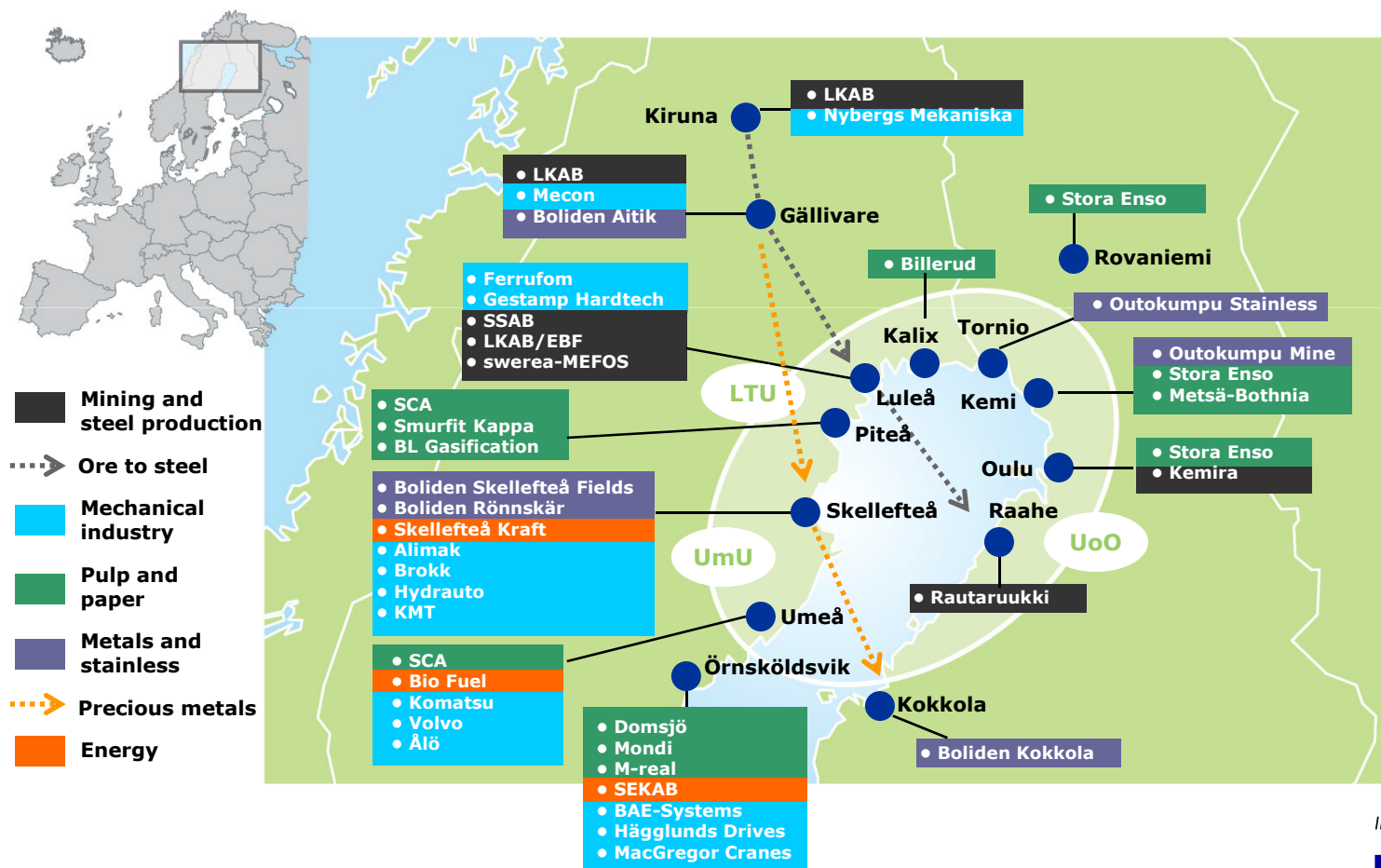
“The industry is more important today than in 1970”

- The industry and industry-related services currently account for just over 27 per cent of GDP, **more than in 1970**
- The industry directly employs more than 700,000 people
- Indirectly, the manufacturing industry employs an estimated **1.5 million people** and exports account for about 80 per cent of our exports
- Each manufacturing job is estimated to give rise to **between one and three jobs** in the surrounding business community
- During the boom of the early 2000s an estimated 50 per cent of growth came from **productivity increases** within the industry

Source: SKGS

Bothnia Bay area

Plants & facilities



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- # Ships
-
- The map displays various shipbuilding hubs across Sweden, each represented by a colored dot and a callout box listing local companies or facilities. The locations are color-coded: blue for Kiruna, Gällivare, Kalix, Kemi, Umeå, Örnsköldsvik, Sandviken, Smedjebacken, Västerås, Storung, and Stockholm; purple for Luleå; pink for Piteå; green for Skellefteå; yellow for Bolliden; light blue for Mellansel; dark blue for Västana; and orange for Sturung.
- Kiruna**
 - Softcenter
 - Gällivare/Malmberget**
 - Boldin
 - GeoVision
 - LRAB
 - Kalix**
 - Billerud Karlsborg
 - Electrotech
 - Kemi**
 - Kemi, Finland
 - Digipolis - Kemi Technology Park i samverkan mellan ProcessIT Innovations och Digipolis har följande företag deltagit:
 - Outokumpu Stainless Oy Tomio
 - Outokumpu Chromo Oy, Kemi gruva
 - Stora-Enso Oyj Fine Papers, Kemi
 - Erona Oy, Kemi
 - Tahviraara Oyj, nikkelngruva, Sodkarmo
 - Rambooms Oy, Lahti
 - Minox Oy, Kemi
 - Luleå**
 - Alent Drying - Bnaarft
 - DaMill - D-Flow Technology
 - EPH Partners - Luleå kommun
 - Länsstyrelsen - MBV Systems
 - Mine Tec - Optimation
 - Rubio - SSAB Torsjylt
 - Svensk Verktygsteknik
 - Swerea-Mefos
 - Piteå**
 - Corvison Technology
 - Piteå kommun
 - SCA Munksgård
 - Smartfit Rappa Kraftliner
 - SunPine
 - Bolliden**
 - Bolliden
 - Mellansel**
 - Höglands Drives
 - Växjö**
 - Mendi Dynas
 - Sandviken**
 - FindT
 - Smédjebacken**
 - Ovako Bar
 - Västerås**
 - ABB Corporate Research
 - Storung**
 - Noetalk
 - Örnsköldsvik**
 - BAE Systems
 - Dempsjö Fabrikar
 - Eurocon Analyzer
 - Eurocon Optimization
 - Macgregor Cranes
 - MoRe Research - M-Real
 - Processum - SERAB
 - Umeå**
 - Algory Simulation
 - FalcCom - Komatsu Forest
 - Ladoknheten - Länsstyrelsen
 - Normmjeriet - Örgy Simulations
 - Regsys - SCA Obbola
 - SeaFlex - Slagforskl
 - Svenska Forsäkringsfabriken
 - TRIMMA - Umeå kommun
 - Volvo IT
 - Volvo Lastvagnar
 - Skellefteå**
 - Adapticum
 - Bolliden Förvarssweden
 - Data District - Explicit
 - Opticonic
 - Skellefteå kommun
 - Skellefteå Kraft
 - Stockholm**
 - SIX AB



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Where IoT has the greatest or could have the greatest potential for the process industry/process automation

- **Recycling** of materials (electronics, scrap metal, paper)
 - **Maintenance** of equipment, eMaintenance
 - **Facilities index**
 - **Logistics** to, from, between and within facilities
 - **Energy** control and energy optimization
 - **Material tracking** in discrete and continuous flows
 - **Safety** for people and equipment
 - **Positioning** of people and equipment
-
- “Talk about” instead of “look, analyze and ask”

Expectations from IoT

- **Components** containing measurement systems, signal processing, energy supply, communication and ID
- **Measures** pressure, temperature, flow, vibration, speed, acceleration but maybe emit “processed and new information”
- Adequate measurement and position **precision**
- Give **position and ID**
- On-line and real-time
- **Robust**, safe and fault tolerant
- No batteries and **low energy** consumption
- Configured and calibrated **automatically** and requires no maintenance
- **Does not soil** production or products
- Must have **applications** that integrate, gather, analyze and make it usable

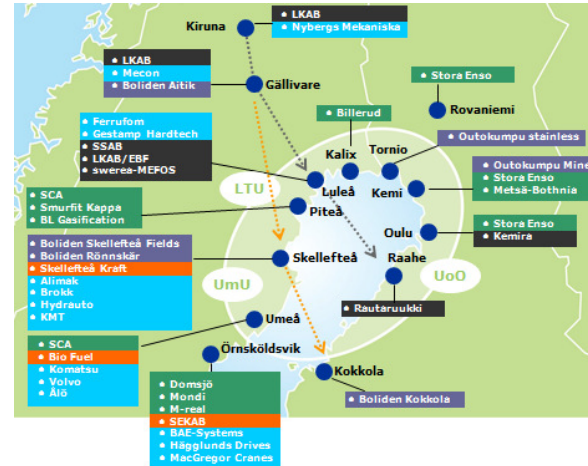
And for some applications

- Have their own **health cards**/records.

Investing in your future

● Regional

- Projects (in various stages)
- Project portfolios
- Technology clusters
- Research programs



● National

- **National strategic agenda**
“Automation for Process Industries”
- Project portfolios
- Collaboration

● European, International

- **ProcessIT.EU**
- Projects



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