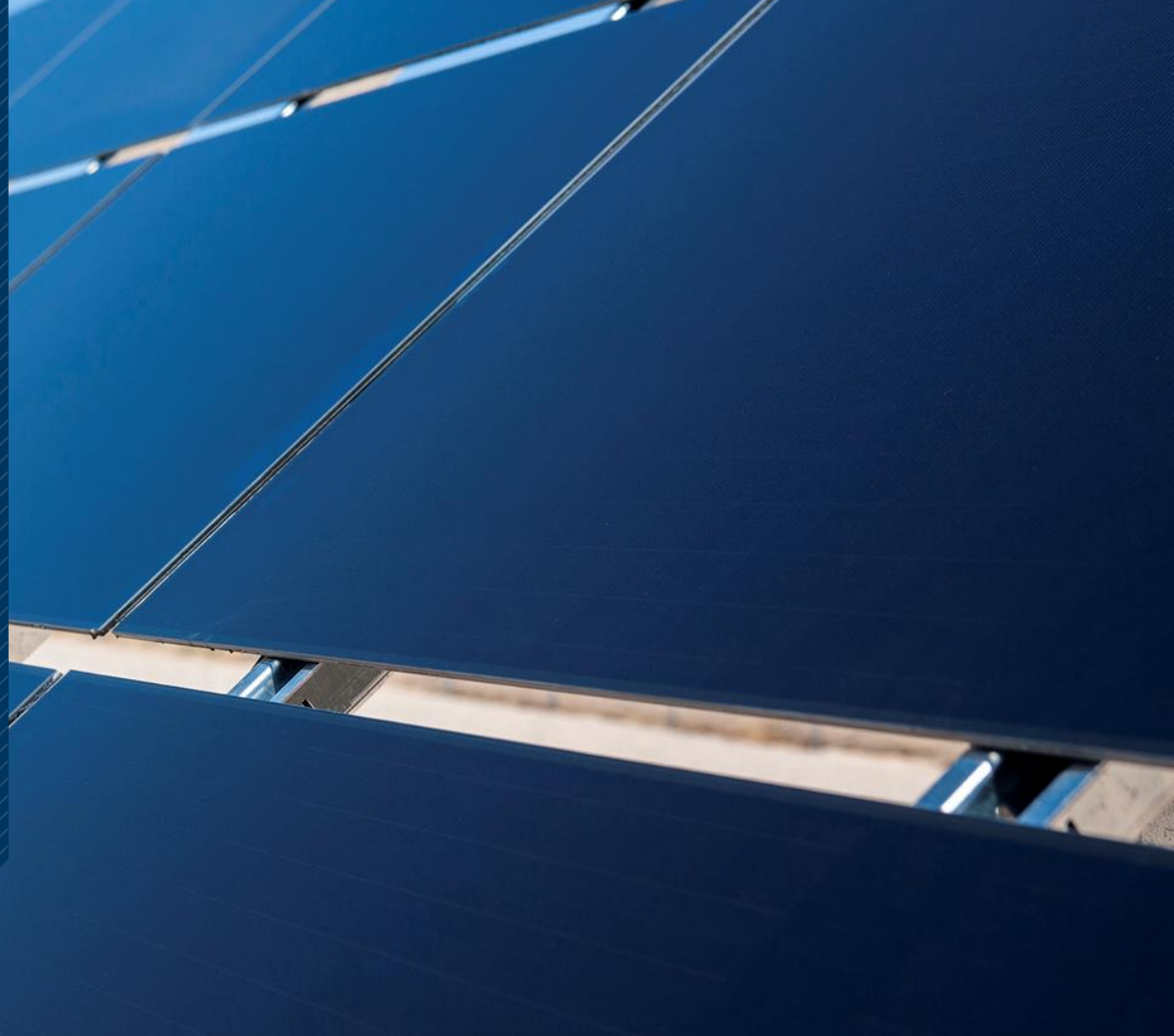
FIRST SOLAR & INDUSTRY 4.0

First Solar®



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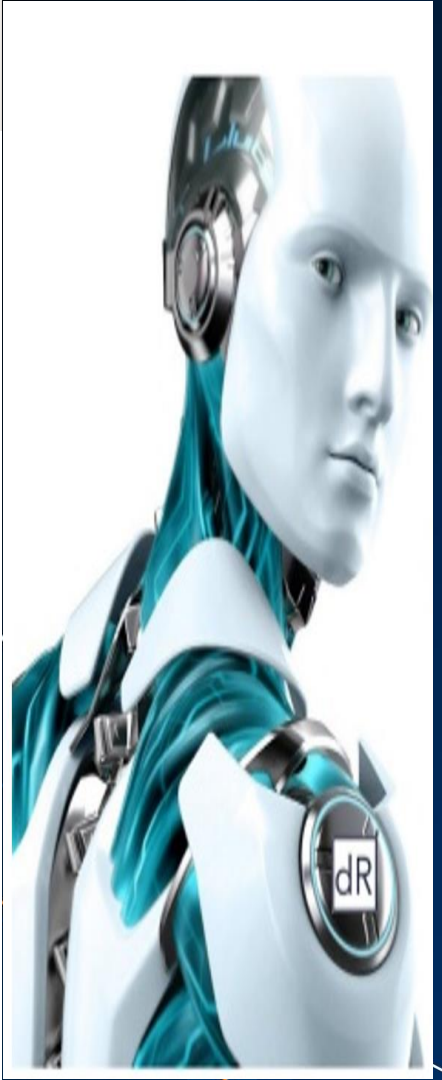
GET READY FOR (R)EVOLUTION !!



Gartner Predicts

Immersive Shopping Experiences

By 2020, 100 million consumers will shop in augmented reality.

Algorithms at Work

By 2020, algorithms will positively alter the behavior of over 1 billion global workers.

Wearables Cut Healthcare Costs

By 2020, 40% of employees can cut their healthcare costs by wearing a fitness tracker.

Voice First Browsing

By 2020, 30% of web browsing sessions will be done without a screen.

Blockchain Grows Up

By 2022, a blockchain-based business will be worth $10 billion.

IoT Saves Trillions

By 2022, IoT will save consumers and businesses $1 trillion a year in maintenance, services and consumables.

FUTURE TECHNOLOGY – GET READY FOR (R)EVOLUTION

(R)EVOLUTION?! - Industry 4.0 in 4 dimensions

Video link:

https://youtu.be/MZkY9HNCiM0

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AUGMENTED/MIXED REALITY - MICROSOFT HOLOLENS

Video Link:
https://www.youtube.com/watch?v=8OWhGiyR4Ns

Brings new vision to elevator maintenance

1

2

Hololens and Safety Glass

3

Virtual Interactive Guide

4

5

Virtual Collaborative Problem Solving

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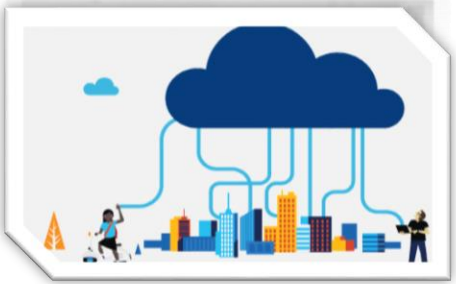
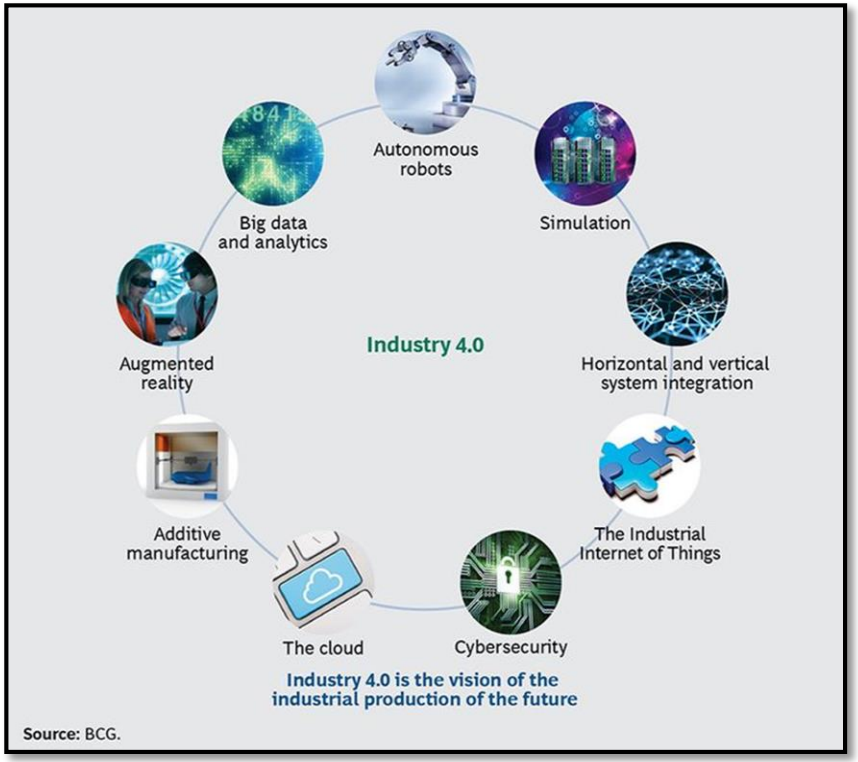
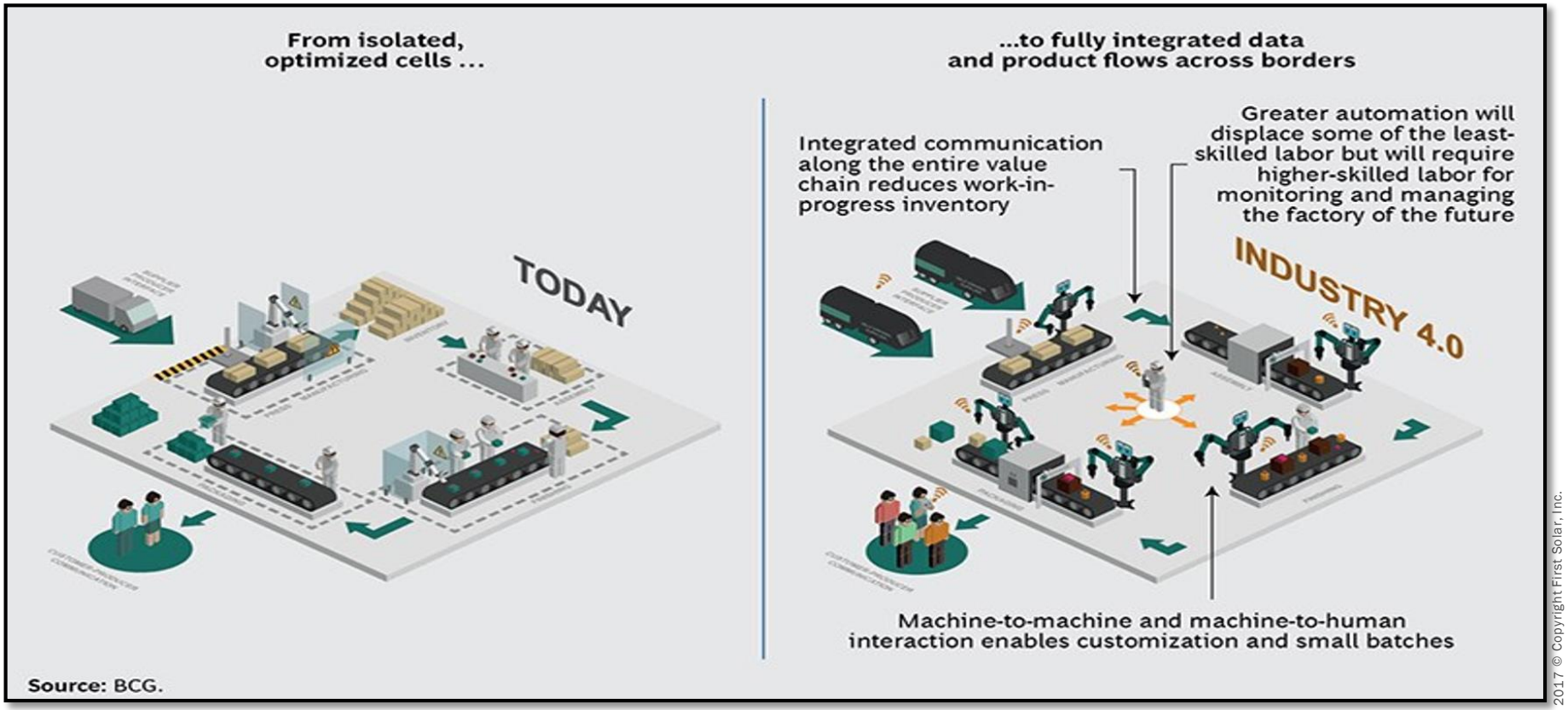
INDUSTRY 4.0 – 9 TECHNOLOGY ARE TRANSFORMING INDUSTRIAL PRODUCTION





INDUSTRY 4.0 – CHANGING TRADITIONAL MANUFACTURING RELATIONSHIPS



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INDUSTRY 4.0: MANUFACTURING DATA, IOT & CLOUD TECHNOLOGY

iTOT

- **First Solar** is working with **Technology Industry Leaders (Vendors)** for **IoT Gateway** solution design.

Benefits:

Cost reduction

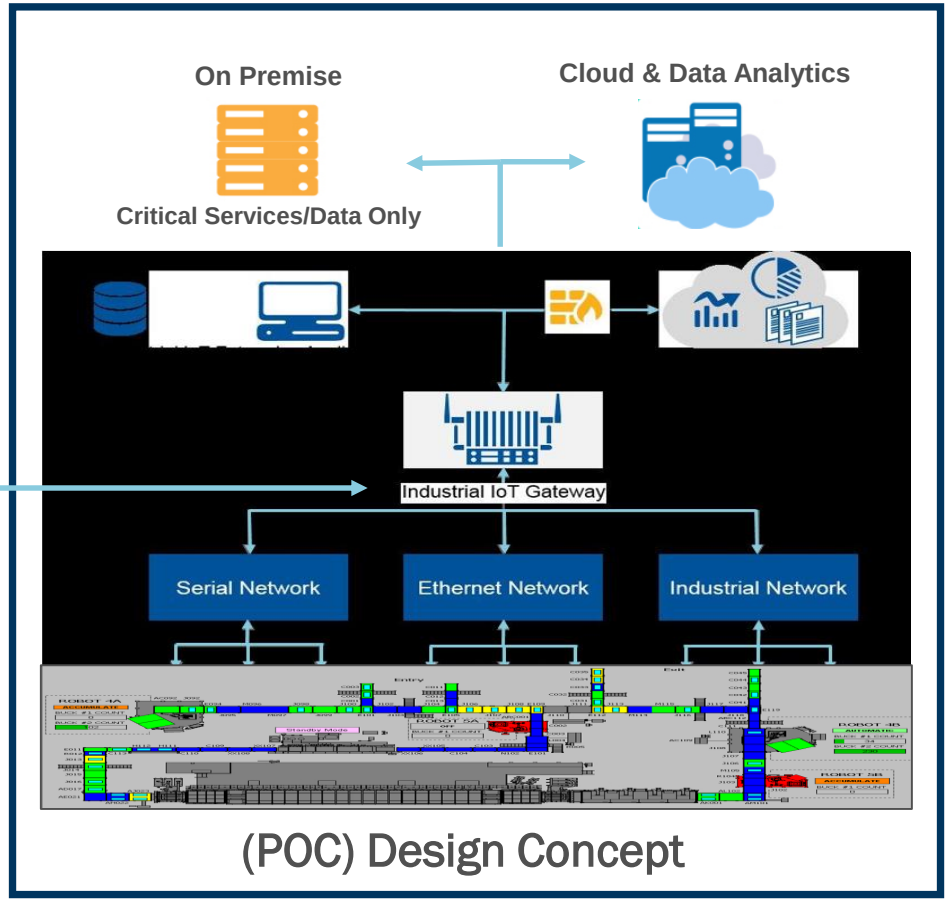
- On Premise limit to critical services/data only
  - Reduces On Premise server & storage
  - Lowered maintenance/recovery cost

Accessibility

- Easier to access data at global level.
- Easier to integrate with Data Analytics;

Scalability

- Easier to scale for future growth at global level



(POC) Design Concept

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INDUSTRY 4.0: BEHAVIOR BASED PREDICTIVE MAINTENANCE: (AUTOMATION)

Cyber-physical systems within Smart Factories make decisions on their own.

Fully automated equipment instruments

Real time PLC control logic predictive failure analysis

Automated data recording

Cloud based email triggering

Work order generation

Maintenance activity

Return to Production

Benefits:

- Maximize yield – lower productivity cost
- Equipment parts utilization – cost saving
- Predictive Maintenance – UPDT prevention

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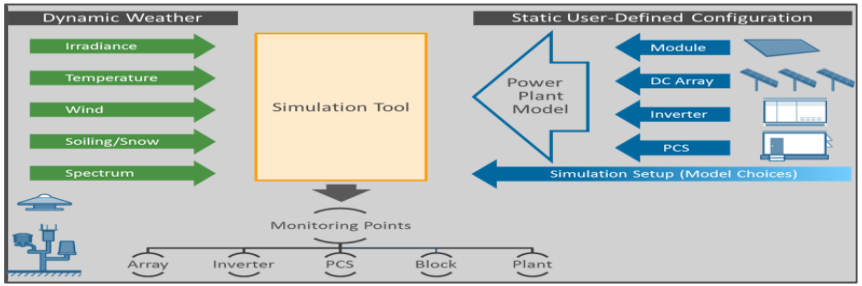
KULIM TEST SITE (KTS) & SOLAR POWERED IT DATA CENTRE (HYBRID)

- Kulim Test Site where First Solar latest technology modules and system are tested.
- Power generated from this **750kWdc** test site is supplied to First Solar Malaysia high volume manufacturing plant and also to its IT Data Centre facility.
- Generates approximately **3,000kWh/day**
- Equivalent to powering avg. **300 households**
- Removing **2.01MT CO2 per day**

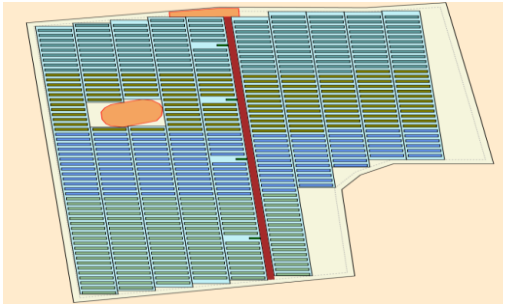
INDUSTRY 4.0: VIRTUAL REALITY (PV PLANT MODEL)

A virtual copy of the Smart Factory/PV Plant created by linking physical sensor data with virtual plant models and simulation models.

Virtual Solar Plant Design Simulation: Models & optimizes power plant energy production over 25-year asset life.



First Solar Operation Center: Manages PV Plant Operation from Remote Center, Provides energy prediction & predictive maintenance, thus increases PV Plant Performance.



Virtual Solar Plant Layout: Provides at product level traceability at PV Plant.

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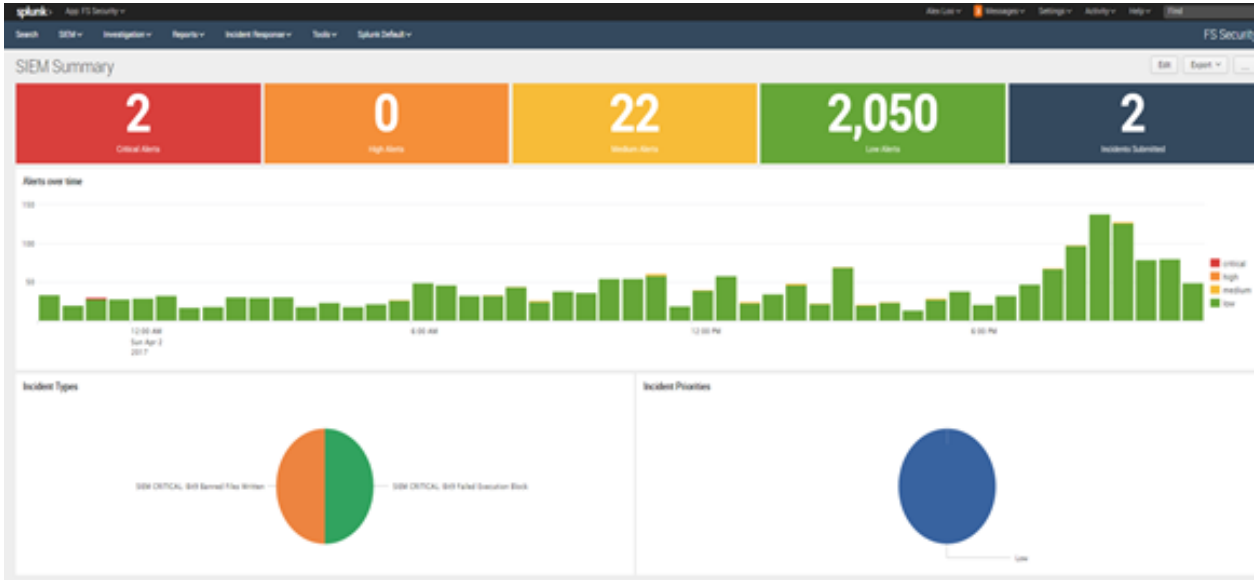
FIRST SOLAR IT SECURITY OPERATIONS



SIEM DASHBOARD

Enable proactive behaviour based real time monitoring and instant threat handling capability

Malaysia

24/7

U.S.A

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CHALLENGES

1. Leadership alignment across departments
2. Industry 4.0 Implementation Strategy/Roadmap:
    a. Security Strategy,
    b. Data Strategy,
    c. IoT & Cloud based solution design roadmap
    d. Talent Development (Training)
3. Dedicated Team for Research & Development and Risk Assessment

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FUTURE TECHNOLOGY – A DAY IN 2020

Watch your day in 2020 [Future Technology]

Discovery Documentary (Car video)

Video link:

https://youtu.be/E03HFA923kw

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