

LEAN PRINCIPLES

FACT SHEET

TASMANIAN
CLIMATE
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OFFICE

This fact sheet provides an overview of Lean tools and principles that can be applied to increase resource efficiency.

Lean originates from the Toyota Production System; it is the continuous quest to maximise value creation and minimise waste in workplaces, supply chains and business processes. There are common elements in the principles of resource efficiency and the principles of Lean in that both focus on eliminating waste and enhancing value.

THE FOUNDATIONS OF LEAN

PEOPLE & PURPOSE

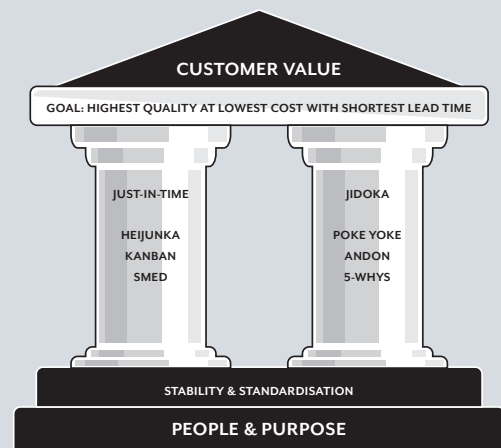
A fundamental principle of Lean is getting everyone involved in the improvement process; this is the foundation of the Lean House.

Everyone in the business should understand what the customer values about the product or process. They should be looking at products, services and processes and asking, "Is this adding value for our customer?" Anything that is not adding value is considered waste.

STABILITY & STANDARDISATION

Processes are standardised, to control costs and maintain consistent quality, and stabilised so that the flow of work can be measured and controlled; this is the second foundation stone of the Lean House.

A stable process is one where there is minimal unscheduled work, no unplanned downtime and limited rush jobs and overtime. An unstable process increases resource usage through rework, labour, and waste in-process.



The Lean House is commonly used to depict the elements of Lean.

THE PILLARS OF LEAN

JUST-IN-TIME

Just-in-Time means we produce only what is needed, when it is needed and in the quantity that is needed. It is based on creating 'flow'. A customer order triggers a chain reaction that pulls materials and components through the process to arrive at each stage, exactly when they are needed, in the quantities required.

JIDOKA

Jidoka focuses on consistently achieving the highest possible quality by eliminating faults and errors as soon as they occur. It empowers operators to stop the line to make immediate corrections. It increases resource efficiency by eliminating waste created by rejects and rework.

LEAN TOOLS

HEIJUNKA

Heijunka is the process by which we achieve flow. It considers *Takt Time*; the rate at which a finished product needs to be completed in order to meet customer demand. Controlled buffer inventories are maintained for more popular items or level out fluctuations. Quick product changeovers, and 'balancing', levels out manufacturing of different products and influencing customer behaviour levels out demand.

A *Heijunka Box* is a visual management tool that communicates to production which product is going to be made next.

KANBAN

Kanban means "signal card".

In a Just-in-Time system, small buffer inventory is kept to overcome bottlenecks and maintain 'flow'. As inventory is depleted, a signal is sent indicating that it needs to be replenished. In a single-piece flow system, the rate at which inventory is used is equal to the rate at which it can be replenished.

A *Kanban Board* is a visual management tool that communicates current inventory levels to production and signals for replenishment.

QUICK CHANGEOVER (SMED)

Quick changeover is referred to as SMED (Single Minute Exchange of Die).

The goal of SMED is to reduce the time taken to change from one product to another in a production system to under 10 minutes (single digit). Changeover time is measured from the last good product off the line before shutting down to the first good product after restarting.

SMED allows the flexibility of short runs of different product types and quick response to customer orders, reducing the need for large inventories.

POKA-YOKE

Poka-yoke means "mistake-proofing". It helps an operator avoid mistakes by making it obvious when a mistake has been made, or physically preventing actions that could cause a mistake to happen. An example is the use of blue gloves in food production; there are very few blue foods so a dropped glove is highly visible.

ANDON

Andon is an alert to let an operator know that a mistake has been made. Together with poka-yoke, the purpose of andon is to stop the process as quickly as possible and correct the error. This may be a light or sound alert and the machine may stop automatically.

Andon prevents materials, labour and energy being wasted on products or services that will need to be reworked or scrapped.

ROOT CAUSE ANALYSIS

An investigation into the root cause for an error occurring. A Cause & Effect Diagram (also known as a Fishbone or Ishikawa diagram) or 5-Whys analysis may be used. Once the root cause is found, controls can be put in place to prevent recurrence.

See the TCCO Fact Sheet on Problem Solving for more information on 5-Whys and Cause & Effect.

The Business Resource Efficiency Program (BREP) is delivered by Business Action Learning Tasmania (BALT) in partnership with the Tasmanian government.

For more information about BREP

Visit www.climatechange.tas.gov.au or businessactionlearningtas.com.au/brep

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