Production Plan

Power BI custom visual — user guide

Weekly production scheduler for multi-area manufacturing: capacity-aware planning, buffer levels, BOM-aware demand and a pipeline map.

Version 3.7 · Power BI Visuals API 5.3 · Query Craft Academy

1. What this visual does

Production Plan is a weekly production scheduler for plants that move material through several stages (areas). From your products, weekly goals, deliveries, machine cycle times and buffer levels it builds a shift-by-shift plan for each area, and shows the whole material flow on a pipeline map. It is a planning tool — to monitor what actually happened on the floor, use the companion Production Tracker visual.

Key capabilities:

- Area model — you define production / quality / buffer areas and the machines in each.
- Capacity-aware scheduling — the plan respects machine cycle times, shift length, planned stops and downtime.
- Pull-through demand — downstream goals and (optionally) the bill of materials drive what upstream areas must make.
- Pipeline map — a clear topology of every area and buffer, with hover highlighting.
- Buffer (Puffer) tracking — up to 10 stock levels with supply-risk warnings.
- This week / next week goals and deliveries, with manual entry when no data is bound.
- Light / dark themes and English / Hungarian / German language.

2. Quick start

1. In Power BI Desktop, Visualizations pane → … (Get more visuals) or Import a visual from a file → add Production Plan.
2. Drop the visual on the page and resize it to fill the canvas.
3. Bind the two mandatory fields: Product Name and Week Number (section 4).
4. Bind the measures that make the plan work: Cycle Time, Produced Quantity, Goal Quantity, Delivery Quantity and Delivery Date. Add Buffer and BOM fields only if you use those features.
5. Enter the report's Edit mode, then add your first area and its machines (section 6).
6. Switch back to reading mode — end users get a read-only, themeable plan and pipeline map.

> Tip. Product Name and Week Number are the only fields the visual strictly needs, but a useful plan also needs Cycle Time, Produced Quantity and your Goal / Delivery measures. Goals and deliveries can instead be typed inside the visual and are saved with the report. Areas, machines and shifts are always configured inside the visual.

3. Recommended data model

A star schema works best. Note that goals and deliveries usually do not have a machine key, which affects how you bind the Machine field (section 4).

Table	Type	Key columns
Dim_Product	Dimension	ProductID, ProductName, ProductType, TypeLevel1/2/3
Dim_Machine	Dimension	MachineID, MachineName
Dim_Date	Dimension	Date (day grain), WeekNumber (1–53)
Dim_Week	Bridge	WeekNumber — links weekly goals to the date axis

Table	Type	Key columns
Dim_CycleTime	Dimension	MachineID, ProductID, CycleTime_min
Dim_BOM	Dimension	ParentProductName, ComponentProductName, QtyPer
Fact_Production	Fact	ProductID, MachineID, Date, ProducedQty, CycleTime_min
Fact_WeeklyGoal	Fact	ProductID, WeekNumber, GoalQty
Fact_Delivery	Fact	ProductID, DeliveryDate (raw day), DeliveryQty
Fact_BufferLevel	Fact	BufferName, Date, BufferQty (one column per buffer)

Relationships: the fact tables link to Dim_Product and Dim_Date; Fact_WeeklyGoal links to the date axis through the Dim_Week bridge on WeekNumber; Dim_BOM links to Dim_Product on both the parent and the component name.

> Important. Switch OFF Power BI “Auto date/time”, and use the Dim_Week bridge for weekly goals — otherwise a weekly goal shows its full total in every week instead of the per-week value.

4. Field bindings

The Bind? column shows how important each field is. Only the two Required fields are strictly enforced, but the Recommended measures drive the actual schedule and fulfilment, so bind them whenever you have the data:

- Required — the visual will not produce a plan without it.
- Recommended — drives scheduling capacity and fulfilment; bind it (Goal / Delivery can be typed in the visual instead).
- Conditional — bind only when the stated condition holds.
- Optional — only needed for a specific feature (buffers, BOM, grouping).

Field	Bind to	Bind?	What it affects
Product Name	Dim_Product[ProductName]	Required	The products planned and shown.
Week Number	Dim_Date[WeekNumber]	Required	This / next-week detection and the weekly goal.
Cycle Time	Dim_CycleTime[CycleTime_min]	Recommended	Machine capacity — how the schedule sizes each shift.
Produced Quantity	Fact_Production[ProducedQty]	Recommended	Completion % and remaining-to-make.
Goal Quantity	Fact_WeeklyGoal[GoalQty]	Recommended	Weekly demand / target (or type it in the visual).
Delivery Quantity	Fact_Delivery[DeliveryQty]	Recommended	Delivery tracking (or type it in the visual).
Delivery Date	Dim_Date[Date] (raw day)	Recommended	When deliveries are due; pair with Delivery Qty.
Machine Name	Dim_Machine[MachineName]	Conditional	Per-machine schedule — bind ONLY if related to every bound fact (see warning).
Puffer Data	buffer measures (up to 10)	Optional	Adds a buffer-stock chart; up to 10.
Product Type	Dim_Product[ProductType]	Optional	Finished / Component classification.
BOM Parent Name	Dim_BOM[ParentProductName]	Optional	Explodes demand to components — assemblies only.
BOM Component Name	Dim_BOM[ComponentProductName]	Optional	Component side of the BOM — assemblies only.
Qty Per Parent	Dim_BOM[QtyPer]	Optional	Components per parent (default 1) — assemblies only.

Field	Bind to	Bind?	What it affects
Type Level 1 / 2 / 3	Dim_Product[Type Level 1..3]	Optional	Quick-select & parallel-lane grouping.

Important. Bind Machine Name only if the machine dimension is related to every fact you bind (production, goals, deliveries). Weekly goals and deliveries usually have no machine key — binding Machine then causes an InvalidUnconstrainedJoin error. In that case leave Machine unbound and use a Power BI page slicer instead.

Tip. Bind Delivery Date to the shared Dim_Date[Date] day column. Aggregated columns (WeekStart, MonthStart) collapse every delivery onto the bucket-start date and also hide buffer snapshots.

5. Configuration & persistence

Production Plan is configured inside the visual (in the report's Edit mode), not from the Power BI Format pane. Everything you set up — areas, machines, shift schedules, planned stops, downtime, routing, manual goals and deliveries, the chosen theme and language — is saved with the report. When Goal / Delivery data roles are not bound, the goals and deliveries you type are kept as manual values and reused every time the report opens.

6. Building your plan, step by step

1. Bind Product Name and Week Number (and any measures you have).
2. Open the report's Edit mode so the editing controls appear.
3. Add an area and choose its type: Production (machines), Quality (inspection) or Buffer (intermediate stock, no machines).
4. Set the area's shift schedule (a template such as “5/2 eight hours”, or Custom) and the planned stops (lunch, breaks, shift change, maintenance). The visual shows the resulting base open time.
5. Add machines to the area — one at a time or by pasting a list — and select which products each can run.
6. Repeat for every area, linking them in sequence (area → buffer → area) so material flows from start to finish.
7. On the goals / deliveries view, set each product's this-week / next-week goal and its delivery quantity and date (or rely on the bound Goal / Delivery measures).
8. Open the plan for an area to see the shift-by-shift schedule, and the pipeline map for the whole flow.
9. Leave Edit mode — end users see a read-only plan they can theme, translate and explore.

7. Working with the plan

Areas & machines

Each area holds its own machines, shift schedule and planned stops. Machines can be real (matched to your data for cycle times) or virtual aliases that borrow another machine's cycle times. Products are assigned per machine, optionally in bulk using the Type Level attributes.

The schedule

For the selected area and week the visual lays out machines against shifts and fills each slot with the planned quantity, colour-coded per product. Planned stops and downtime are shown as markers so you can see lost capacity at a glance. A this week / next week toggle switches the horizon.

Goals, deliveries & fulfilment

The goals view lists every product with its weekly goal, delivery quantity / date and a fulfilment percentage (produced ÷ goal). A weekly summary totals the goal, the produced quantity and the overall completion.

Buffers (Puffer)

Each bound buffer measure becomes its own chart. If upstream capacity plus the buffer cannot cover downstream demand, the visual flags a supply risk so you can react before a stage starves.

BOM-aware demand & colours

When the BOM fields are bound, finished-goods demand is exploded into component demand using Qty Per Parent, so upstream areas are planned for the right component volumes. Products in the same BOM family share a colour family, making the plan easy to read.

Pipeline map

The pipeline map draws every area and buffer as connected nodes showing the material flow. Hovering a node highlights it and its immediate neighbours and dims the rest; the layout aligns branches toward the final stage so the flow stays tidy.

8. Personalisation

- Theme — a light / dark toggle, saved with the report.
- Language — English, Hungarian (Magyar) and German (Deutsch); cycled from the header and saved.
- This week / next week — the planning horizon switch; the current week is detected from your data.

9. Troubleshooting

Symptom	Cause & fix
“No areas yet”	Enter Edit mode and add at least one area with machines.
InvalidUnconstrainedJoin error	Machine is bound but goals/deliveries have no machine key — unbind Machine, use a page slicer.
All deliveries fall on one date	Delivery Date is an aggregated column — bind the raw Dim_Date[Date] day column.
Weekly goal shows its full total	Use the Dim_Week bridge and bind Week Number from Dim_Date[WeekNumber].
Buffer charts are empty	Bind one or more measures to Puffer Data, and check the buffer fact links to Dim_Date.
Plan looks empty	Check production data exists for the selected week and that machines are assigned products.
Colours look too similar	Very large product sets reuse the colour palette — group or limit the products shown.