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Using **MS Project** to plan the construction of a solar power station

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What is MS Project?

It is a tool to help you run large projects. It helps you:

- Assign resources to tasks
- Track the progress of your project
- Manage your budget
- Analyze Workloads

We are going to build a: Molten salt solar power station

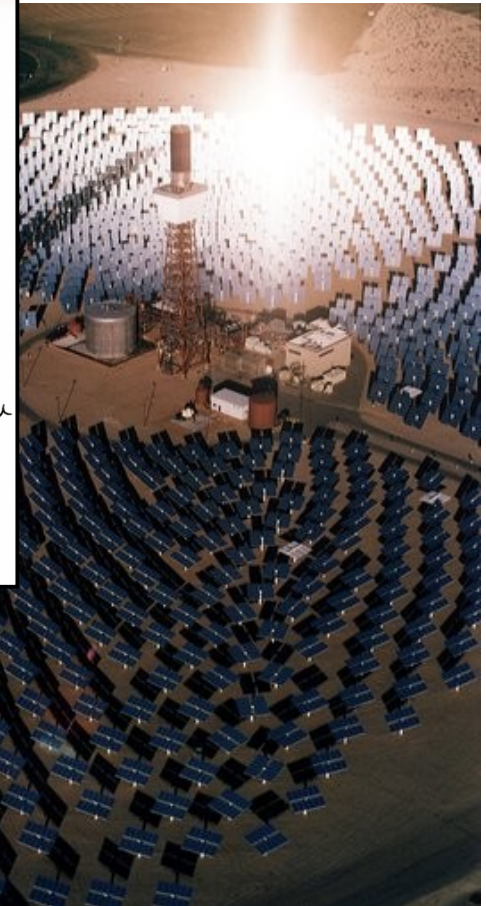
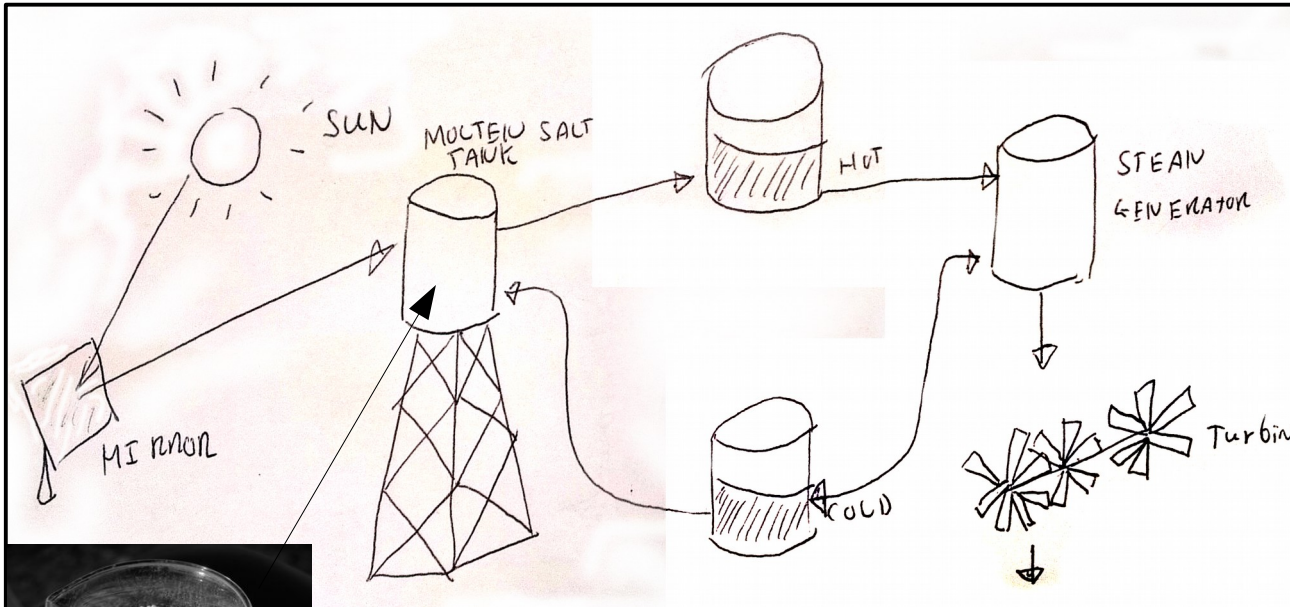


Picture: Barstow, CA; Solar One, NREL



<http://edition.cnn.com/video/?/video/international/2011/10/02/ecosolutions-spain-solar-plant.cnn>

How does it work?



<http://edition.cnn.com/video/?/video/international/2011/10/02/ecosolutions-spain-solar-plant.cnn>

Interesting facts about solar energy.



- There is a lot of energy in sunlight
 - Max power flux 1.5 kW m^{-2}

- Typical solar cell efficiency 15%
- Average electricity demand per person in the UK is 700 W we therefore need 40 m^2 per person.



Planning our project

Tasks:

- Clearing land of rocks
- Install foundations
- Install supports for mirrors
- Construct tower
- Install salt pumping equipment
- Install computer control equipment
- Connect to grid

Planning our project

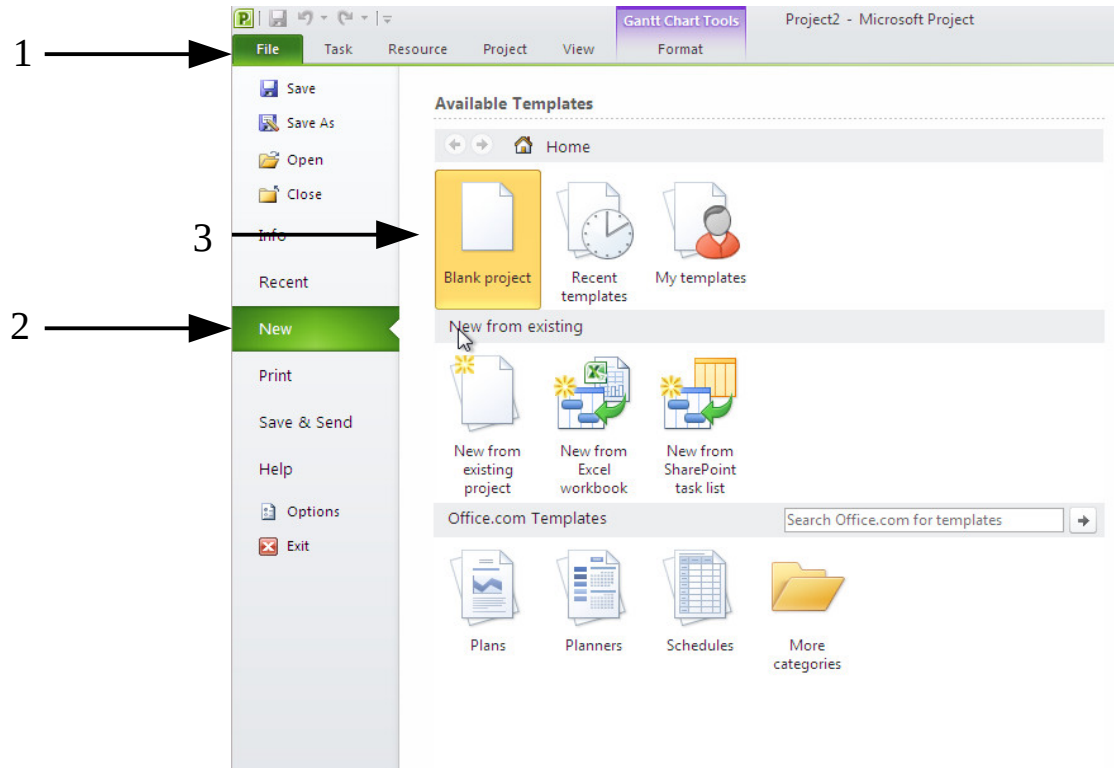
Resources:

- Bulldozers
- Concrete pumps
- Mettle working team
- Turbine installation team
- Electrical Engineers

Making a new project

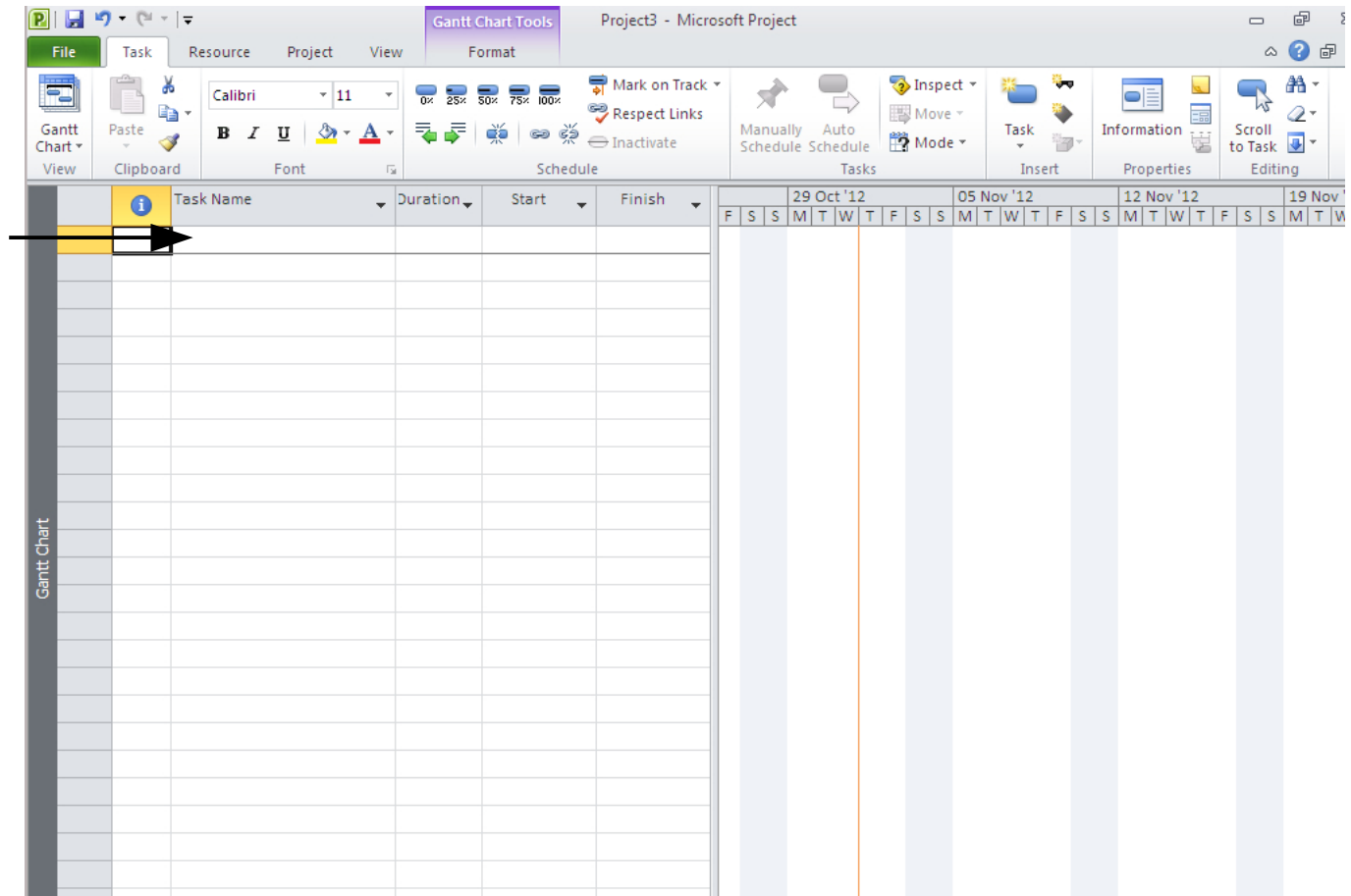
Run MS Project then:

- Click on file
- New
- Blank project



Our blank project

Double click
on the first row



Adding our first task

Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: Clearing land

Duration: 10 Estimated

Percent complete: 0

Priority:

Schedule Mode: Manually Scheduled Auto Scheduled Inactive

Dates

Start: Finish:

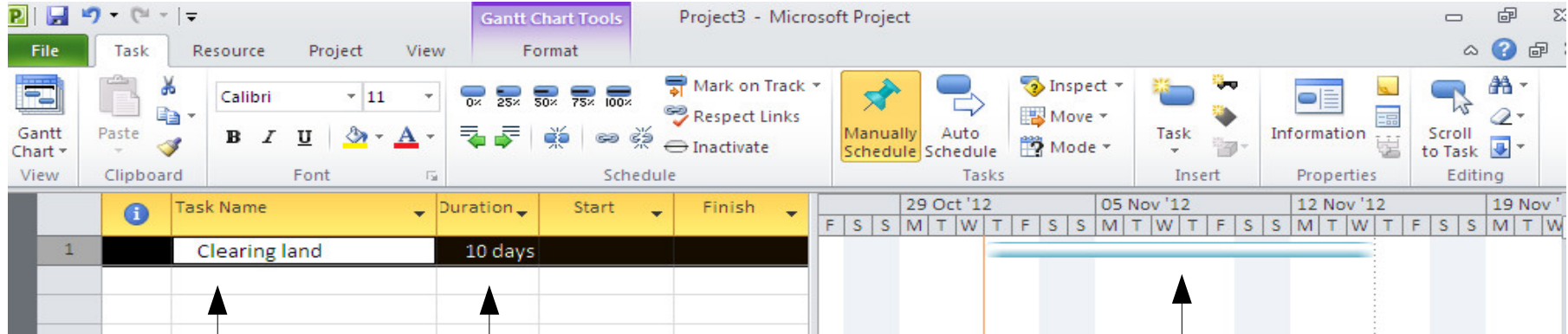
Display on Timeline Hide Bar Rollup

Help OK Cancel

Time it lasts

Task name

Building the project task-by-task



The task

Duration

First bar on gantt chart

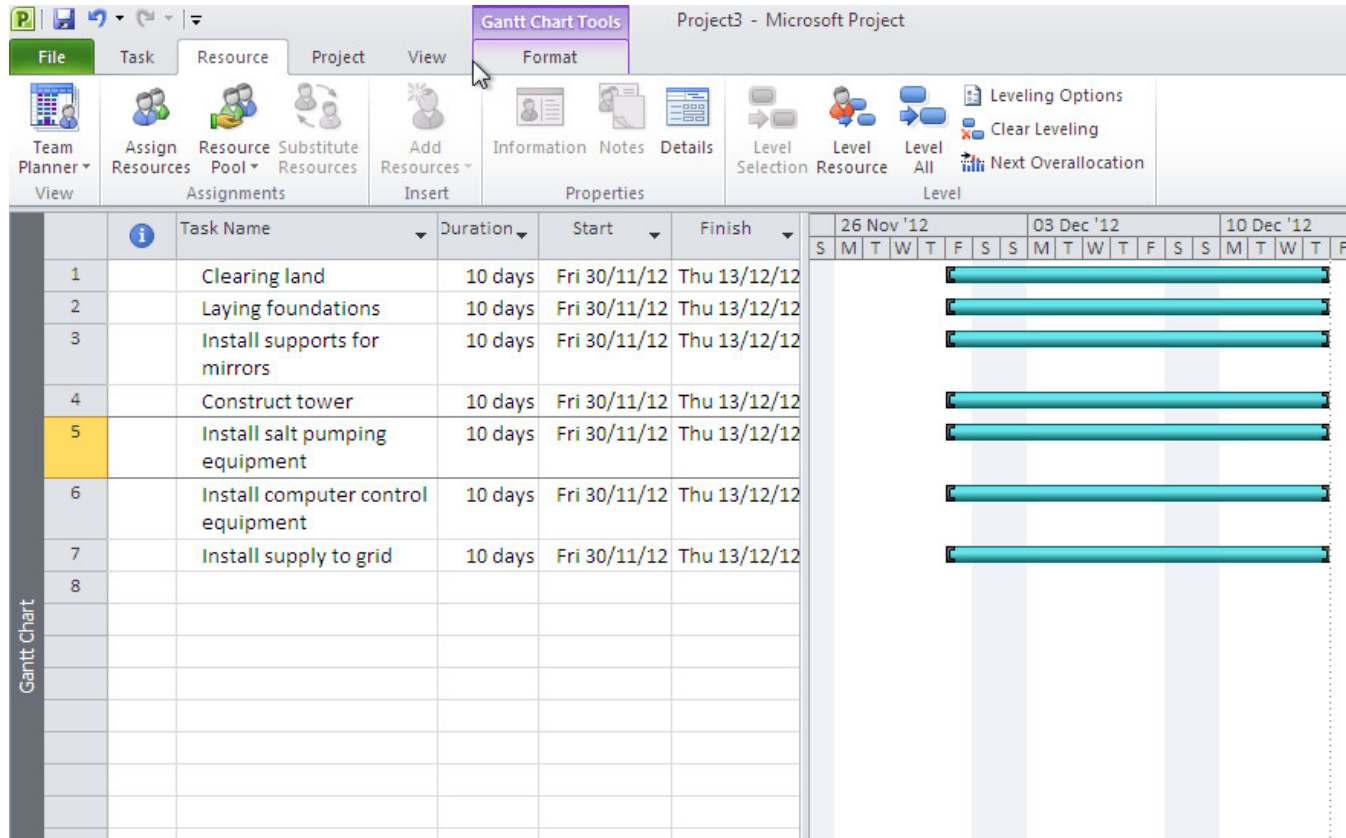
Add the duration of all the tasks

The screenshot shows the Microsoft Project interface with the 'Gantt Chart Tools' ribbon active. The ribbon includes tabs for 'File', 'Task', 'Resource', 'Project', 'View', and 'Format'. The 'Format' tab is selected, showing options for font (Calibri, size 11), bold, italic, underline, and color. The 'Schedule' section includes options for 'Mark on Track', 'Respect Links', and 'Inactivate'. The 'Tasks' section includes 'Manually Schedule' and 'Auto Schedule' buttons.

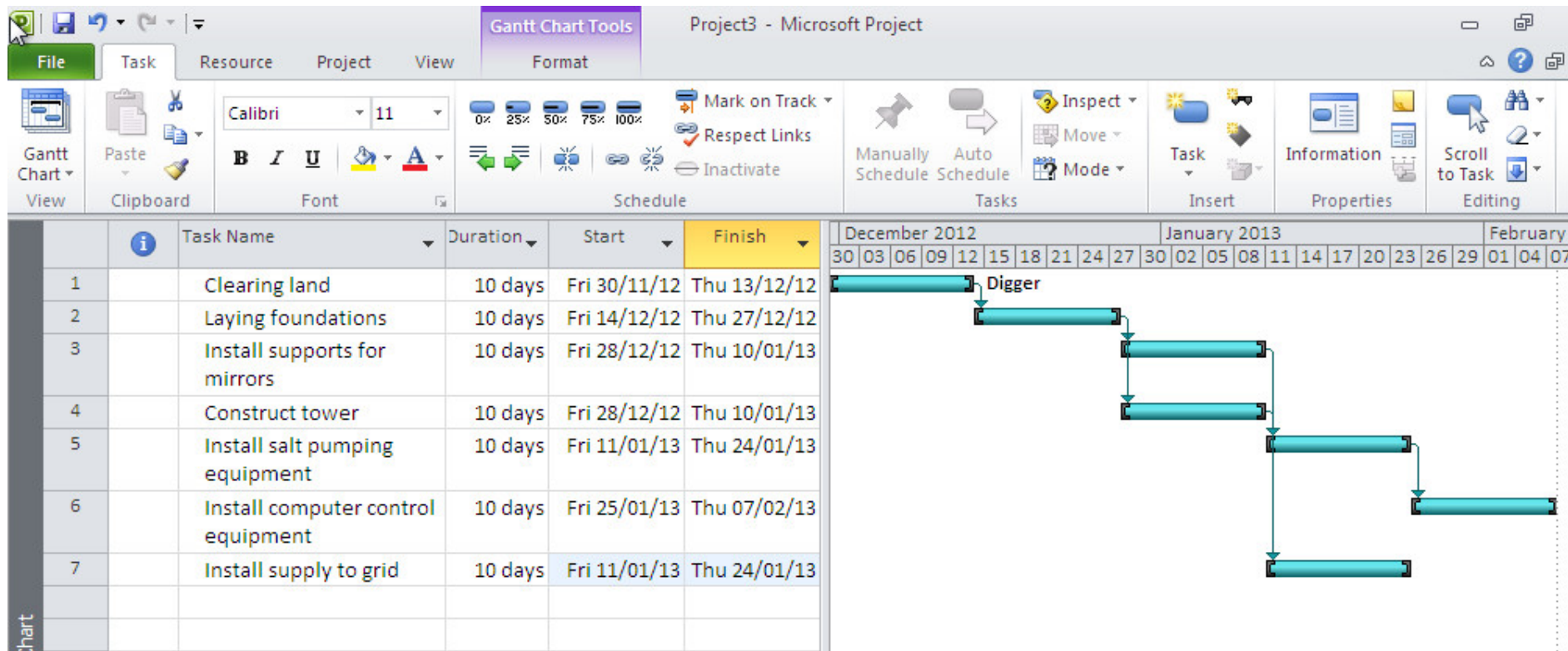
The task list table below shows the following data:

	Task Name	Duration	Start	Finish
1	Clearing land	10 days	Wed 31/10/12	Tue 13/11/12
2	Laying foundations	10 days	Thu 15/11/12	Ned 28/11/12
3	Install supports for mirrors			
4	Construct tower			
5	Install salt pumping equipment			
6	Install computer control equipment			
7	Install supply to grid			

The project plan will look like this



Setting task dependencies (links)



Drag drop arrows between the bars to link the tasks

Adding resources to the project

The screenshot displays the Microsoft Project interface with the 'Gantt Chart Tools' ribbon active. The 'Assign Resources' dialog box is open, showing the task 'Install supply to grid' (Task ID 7) and a list of resources from Project3. The task is highlighted in yellow in the Gantt chart, and the resource 'Bulldozers' is selected in the dialog box. The Gantt chart shows a sequence of tasks: 'Clearing land', 'Laying foundations', 'Install supports for mirrors', 'Construct tower', 'Install salt pumping equipment', 'Install computer control equipment', and 'Install supply to grid'. The 'Install supply to grid' task is currently unassigned, as indicated by the black bar in the Gantt chart. The 'Assign Resources' dialog box has a table with the following data:

Resource Name	R/D	Units	Cost
Bulldozers			
Concrete pumps			
Mettle working team			
Turbine installation team			

The dialog box also includes buttons for 'Assign', 'Remove', 'Replace...', 'Graph', 'Close', and 'Help'. A note at the bottom of the dialog box states: 'Hold down Ctrl and click to select multiple resources'.

Assigning resources to our tasks

The screenshot shows the Microsoft Project interface. The ribbon is set to 'Gantt Chart Tools' with the 'Format' tab selected. The task list on the left contains the following tasks:

ID	Task Name	Duration	Start	Finish	Pr
1	Clearing land	10 days	Fri 30/11/12	Thu 13/12/12	
2	Laying foundations	10 days	Fri 14/12/12	Thu 27/12/12	1
3	Install supports for mirrors	10 days	Fri 28/12/12	Thu 10/01/13	2
4	Construct tower	10 days	Fri 28/12/12	Thu 10/01/13	2
5	Install salt pumping equipment	10 days	Fri 11/01/13	Thu 24/01/13	4
6	Install computer control equipment	10 days	Fri 25/01/13	Thu 07/02/13	5
7	Install supply to grid	10 days	Fri 11/01/13	Thu 24/01/13	3

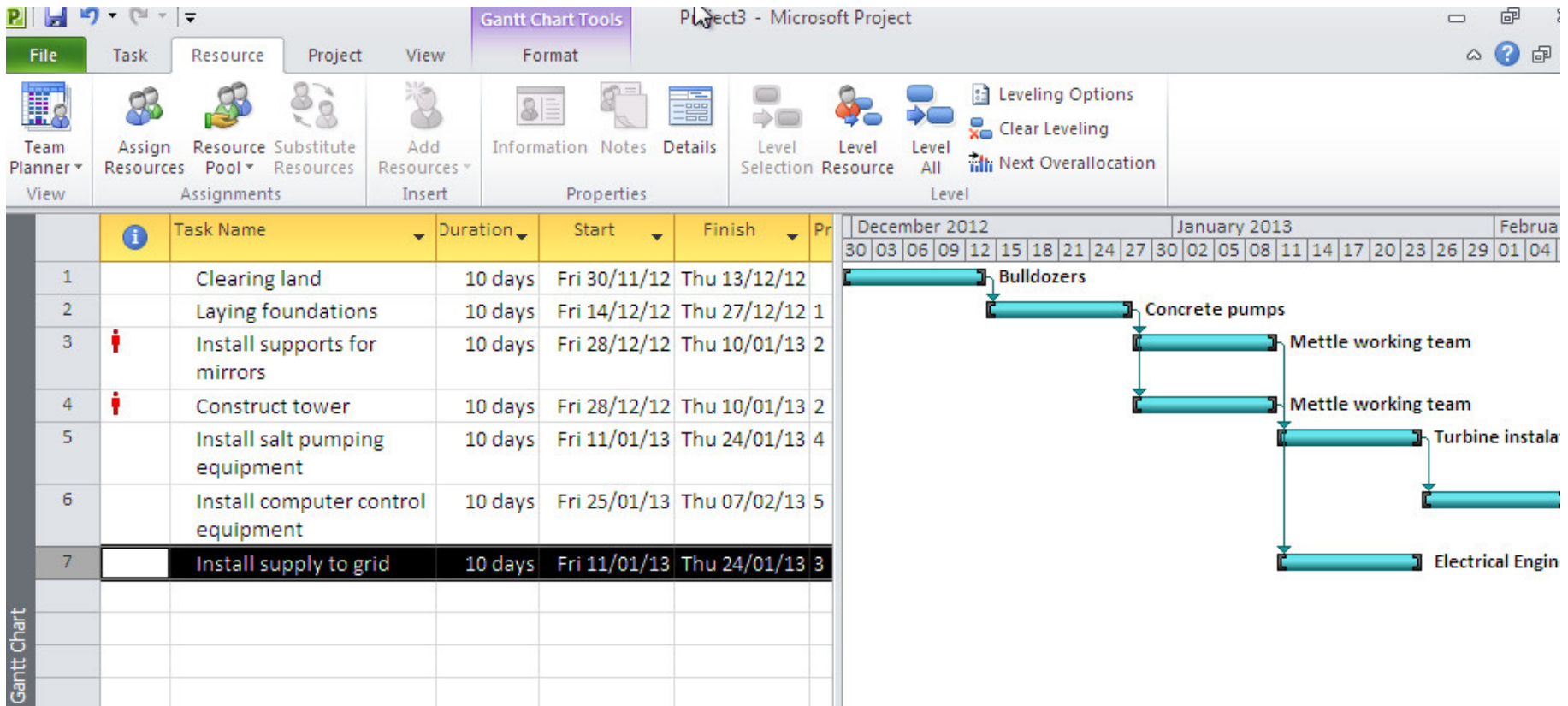
The Gantt chart shows a task bar for 'Bulldoz' starting on 30/11/12 and ending on 13/12/12. A context menu is open over this bar, with the 'Information' option selected. The menu options are: Format Bar..., Manually Schedule, Auto Schedule, Information, Notes..., and Add to Timeline.

Select the resource to assign

The screenshot displays the Microsoft Project interface with the 'Gantt Chart Tools' ribbon active. The 'Resources' tab is selected, and the 'Task Information' dialog box is open for the task 'Laying foundations'. The dialog box shows the task name, duration (10 days), and a list of resources to be assigned.

Resource Name	Assignment Owner	Units	Cost
Bulldozers			
Concrete pumps			
Mettle working team			
Turbine instalation team			

We have assigned the resources but the mettle working team has too much work

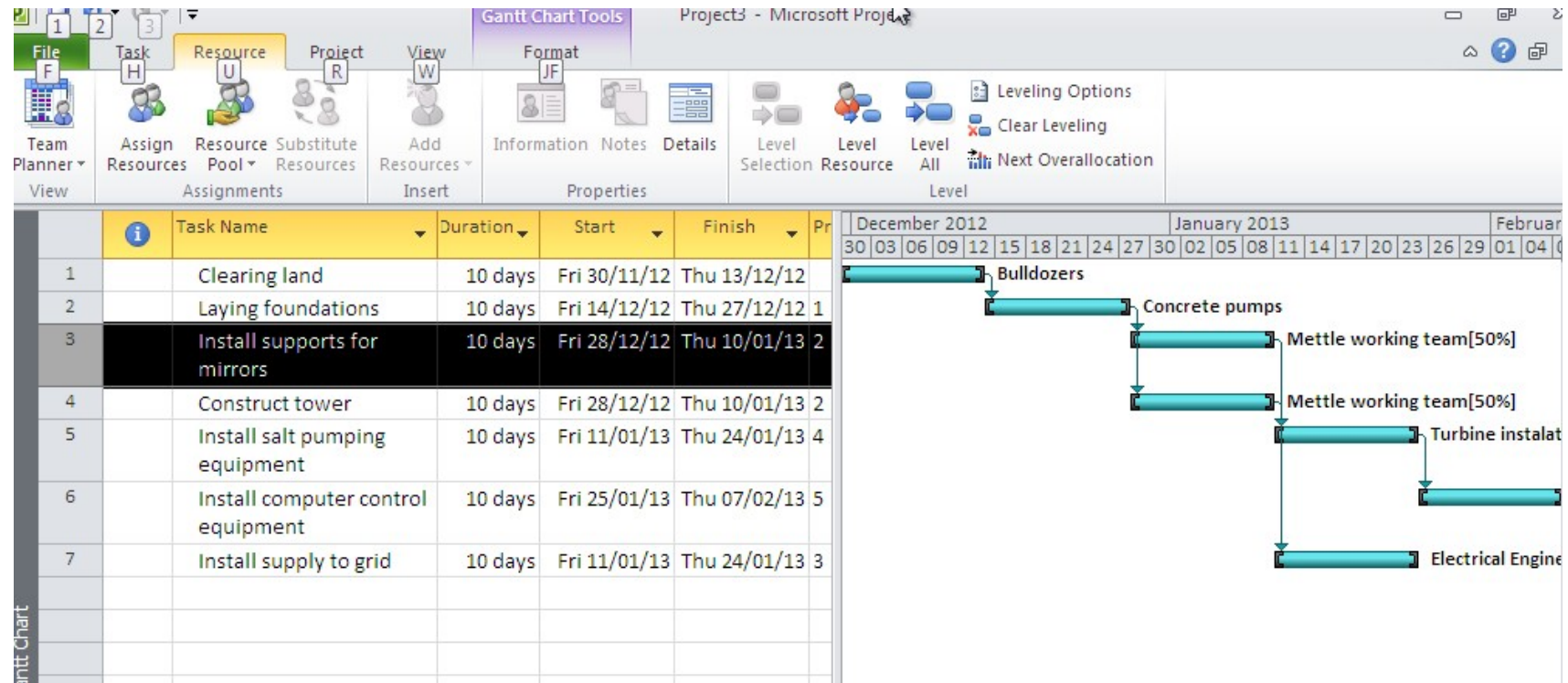


Go back to the Task information box and reduce the work load for the mettle working team.

The screenshot shows the Microsoft Project interface with the 'Gantt Chart Tools' ribbon active. The 'Task Information' dialog box is open, displaying the 'Resources' tab for the task 'Laying foundations'. The task duration is 10 days. The resources list includes 'Bulldozers', 'Concrete pumps', 'Mettle working team', and 'Turbine installation team'. An arrow points to the 'Units' column for the 'Mettle working team' resource, with a text overlay: 'Click on Units and reduce it to 50%'. The background shows a Gantt chart with tasks listed on the left and a calendar grid for December 2012 and January 2013.

Resource Name	Assignment Owner	Units	Cost
Bulldozers			
Concrete pumps			
Mettle working team			
Turbine installation team			

Now we are not overworking the mettle working team.



Adding a mile stone:

This is a task with no length

Project3 - Microsoft Project

Gantt Chart Tools

File Task Resource Project View Format

Gantt Chart View | Clipboard | Font (Calibri, 11) | Schedule (0%, 25%, 50%, 75%, 100%) | Mark on Track, Respect Links, Inactivate | Manually Schedule, Auto Schedule | Tasks (Inspect, Move, Mode) | Insert (Task, Information, Properties) | Scroll to Task

	Task Name	Duration	Start	Finish	Pr	2012		Qtr 4, 2012		Qtr 1, 2013			Qtr 2, 2013			Qtr 3, 2013		
						Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	Clearing land	10 days	Fri 30/11/12	Thu 13/12/12														
2	Laying foundations	10 days	Fri 14/12/12	Thu 27/12/12	1													
3	Install supports for mirrors	10 days	Fri 28/12/12	Thu 10/01/13	2													
4	Construct tower	10 days	Fri 28/12/12	Thu 10/01/13	2													
5	heavy construction work finished	0 days	Mon 14/01/13	Mon 14/01/13														
6	Install salt pumping equipment	10 days	Fri 11/01/13	Thu 24/01/13	4													
7	Install computer control equipment	10 days	Fri 25/01/13	Thu 07/02/13	6													
8	Install supply to grid	10 days	Fri 11/01/13	Thu 24/01/13	3													

ft Chart

Task List:

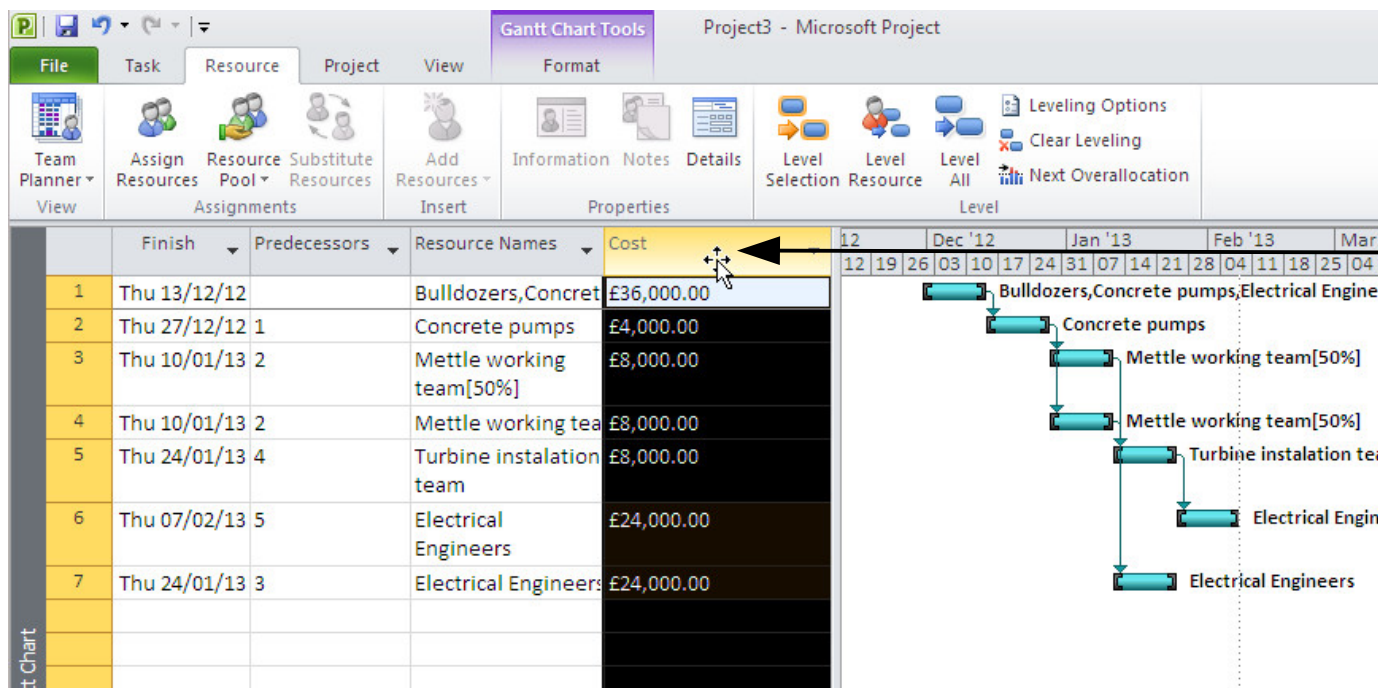
- Bulldozers
- Concrete pumps
- Mettle working team[50%]
- Mettle working team[50%]
- 14/01
- Turbine instalation team
- Electrical Engineers
- Electrical Engineers

Adding costs for the resources

The screenshot displays the Microsoft Project interface with the 'Assign Resources' dialog box open. The dialog shows a list of resources from 'Project3' with columns for Resource Name, R/D, Units, and Cost. The resources listed are Bulldozers, Concrete pumps, Electrical Engineers, Mettle working team, and Turbine installation team. The 'Resource Information' dialog box is also open, showing the 'Costs' tab for the resource 'Bulldozers'. It displays a table for cost rate tables with columns for Effective Date, Standard Rate, Overtime Rate, and Per Use Cost. The Standard Rate is set to £100.00/h and the Per Use Cost is £0.00. The Cost accrual is set to Prorated.

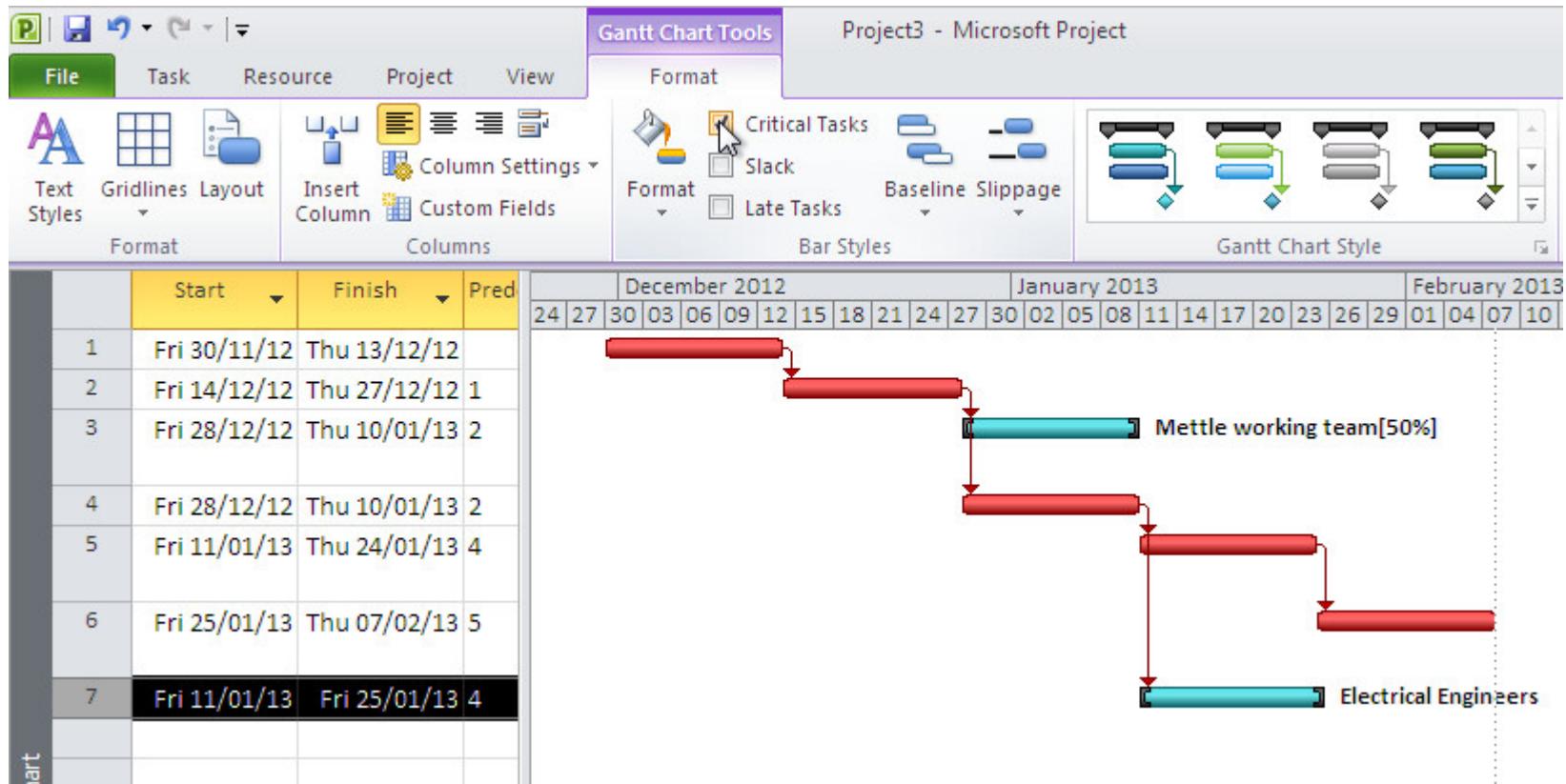
Effective Date	Standard Rate	Overtime Rate	Per Use Cost
--	£100.00/h	£0.00/h	£0.00

Add a new column called costs



Right click and add Costs

Critical path analysis



A critical path finds tasks which if delayed will extend the duration of the project.

Your turn!

- Your task is to plan the construction of an Offshore wind farm. The details can be found on moodle.

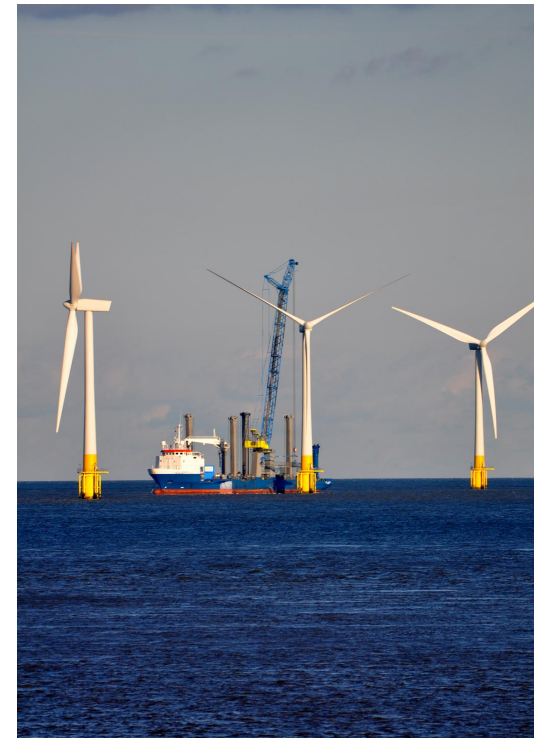


Image: Martin Pettitt