Atom Economy

Chemistry

How much of the reactant mass ends up in the desired product.

Atom economy is the mass of the desired product divided by the total mass of all products.

% atom economy = (Mr of desired product ÷ Σ Mr of all products) × 100

Addition reactions Only one product.	**100% atom economy**
Substitution	**Lower — a by-product forms**
High yield, low atom economy Both matter.	**Still wasteful**

THE COMMON MISTAKE

× Treating atom economy and yield as the same thing

✓ They are independent

A reaction can give 100% yield of a product that is only 40% of the reactant mass. The rest becomes waste by design.

Atom economy is a green chemistry measure: it is about designing the route, not about running it well.