Complexity University / 27 July 2020 / Session One

Introduction to Multiple Capitals

what is the function of capital in complexity?

the traditional view of capital

“

that part of man's stock which he expects to afford him revenue.

”

- Adam Smith

financial capital ⇢ “venture” ⇢ surplus financial capital


inputs
production processes
outputs


inputs
process
outputs


ingredients
cooking
meal

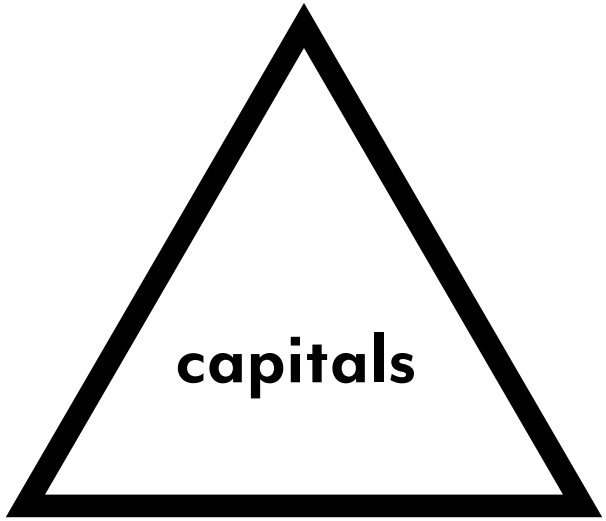
a view of capital in complex systems

axiom 1

there are multiple forms of capital

financial

intellectual



physical

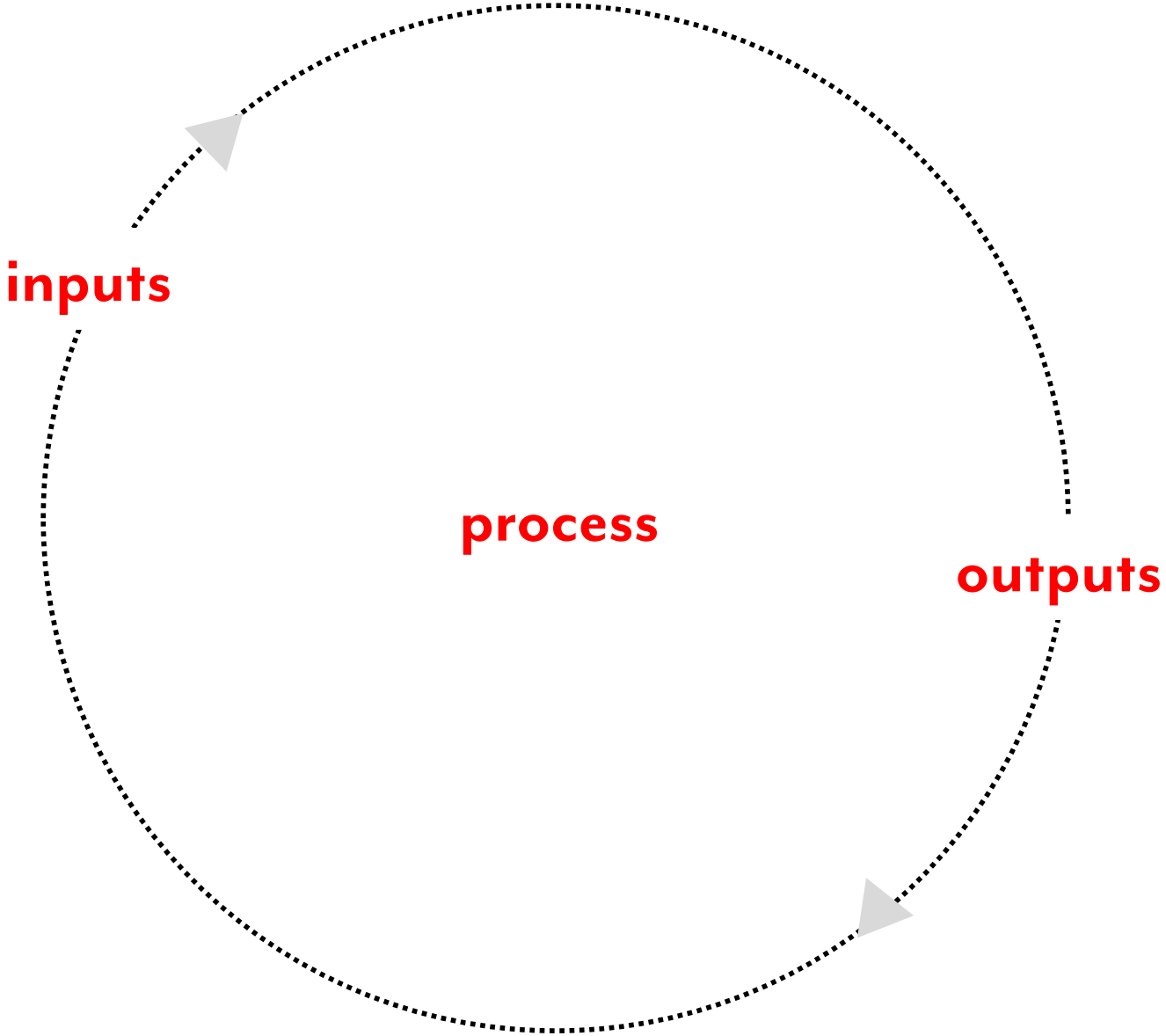
natural

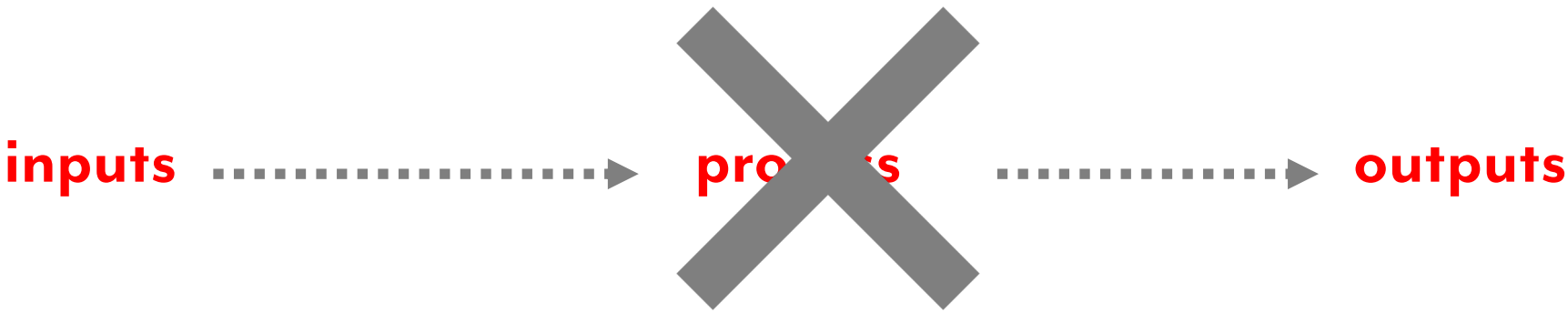
“human”

social

axiom 2

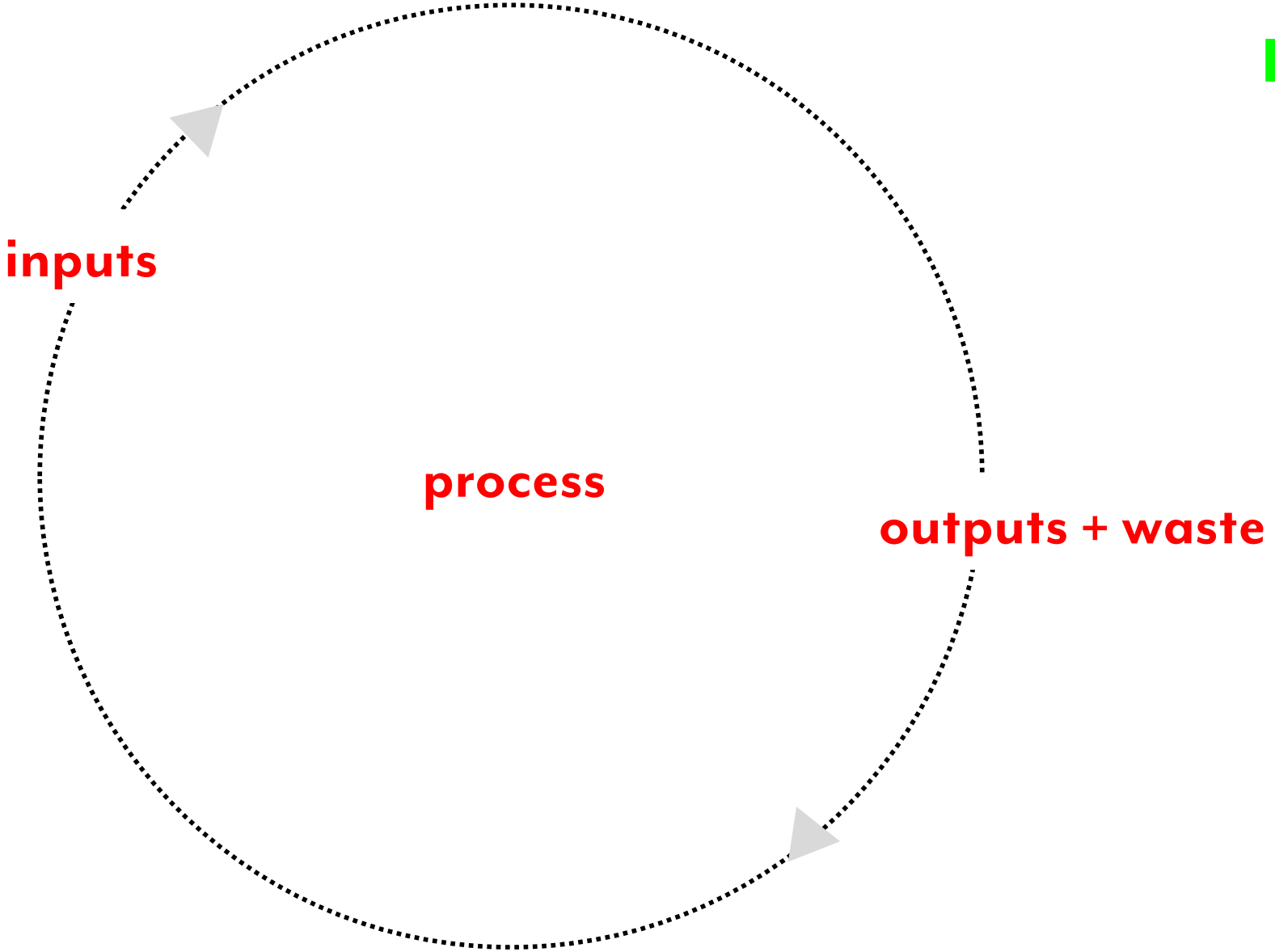
linear process do not exist (even though we like to pretend they do)


inputs
process
outputs


inputs
outputs

there is no such thing as “waste” in nature (other than heat)

but human-designed processes typically generate “waste”


inputs
process
outputs + waste

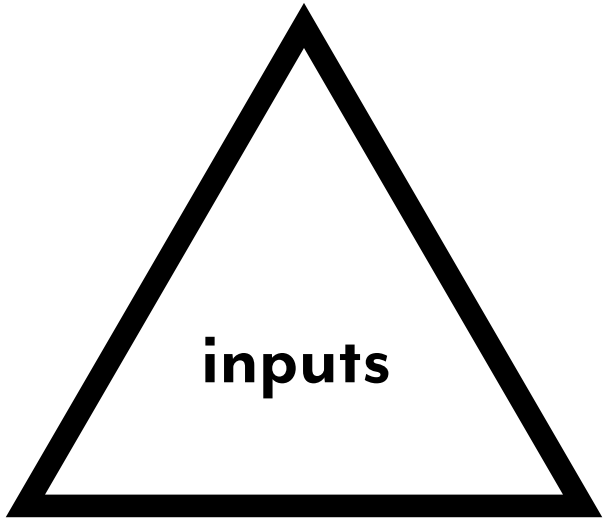
sustainability means “closing the loop” = all outputs are “recycled” to become “inputs” with minimal “waste”

axiom 3

in any healthy system inputs and outputs are balanced

financial

intellectual



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social

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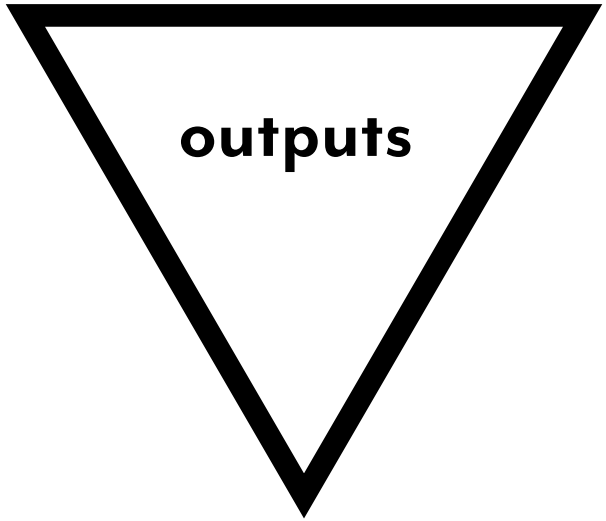
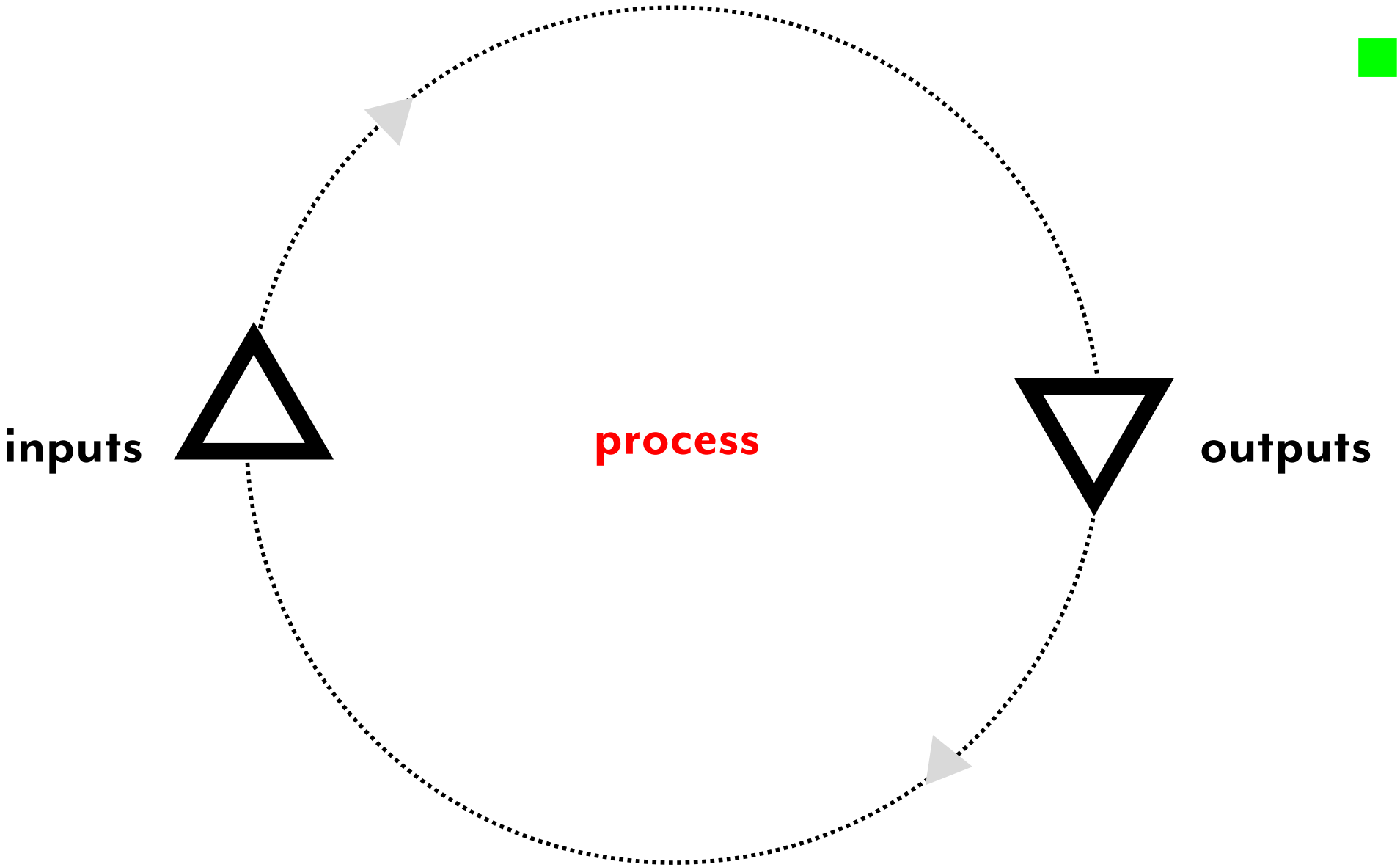


"human"

social

financial

intellectual

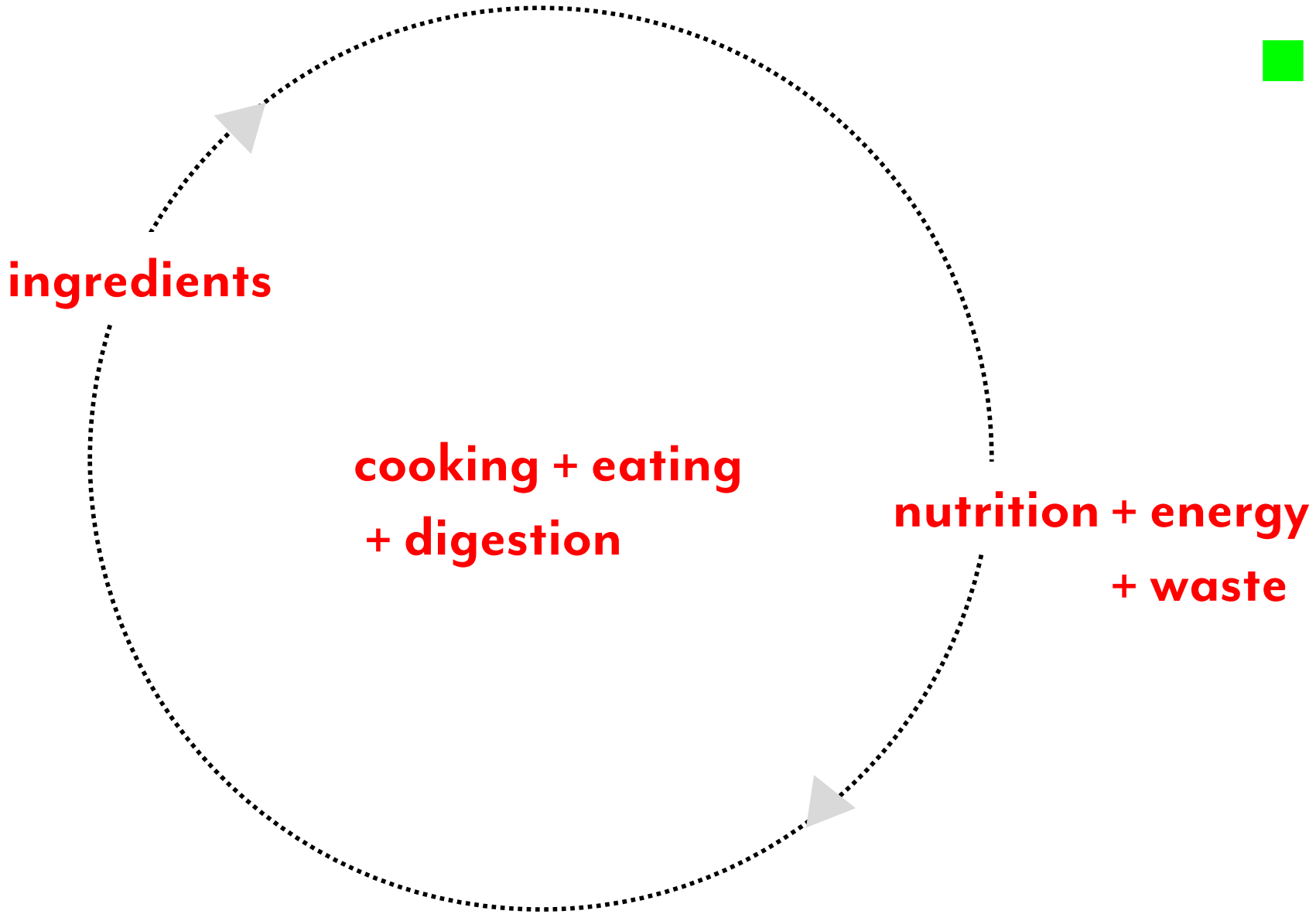

inputs
process
outputs

all processes using energy generate “waste” while efficient processes only generate heat as “waste,”

inefficient processes generate “wastage”

ie. outputs that are not, or cannot be, re-used

what does it mean to eat “sustainably”?


ingredients
cooking + eating
+ digestion
nutrition + energy
+ waste

adults need between 2000-2500 calories per day

2500 calories

what does it mean to eat “sustainably”?

2500 = 2500 calories = maintenance

2500 < 2500 calories = ?

2500 < 2500 calories = starve

2500 > 2500 calories = surplus

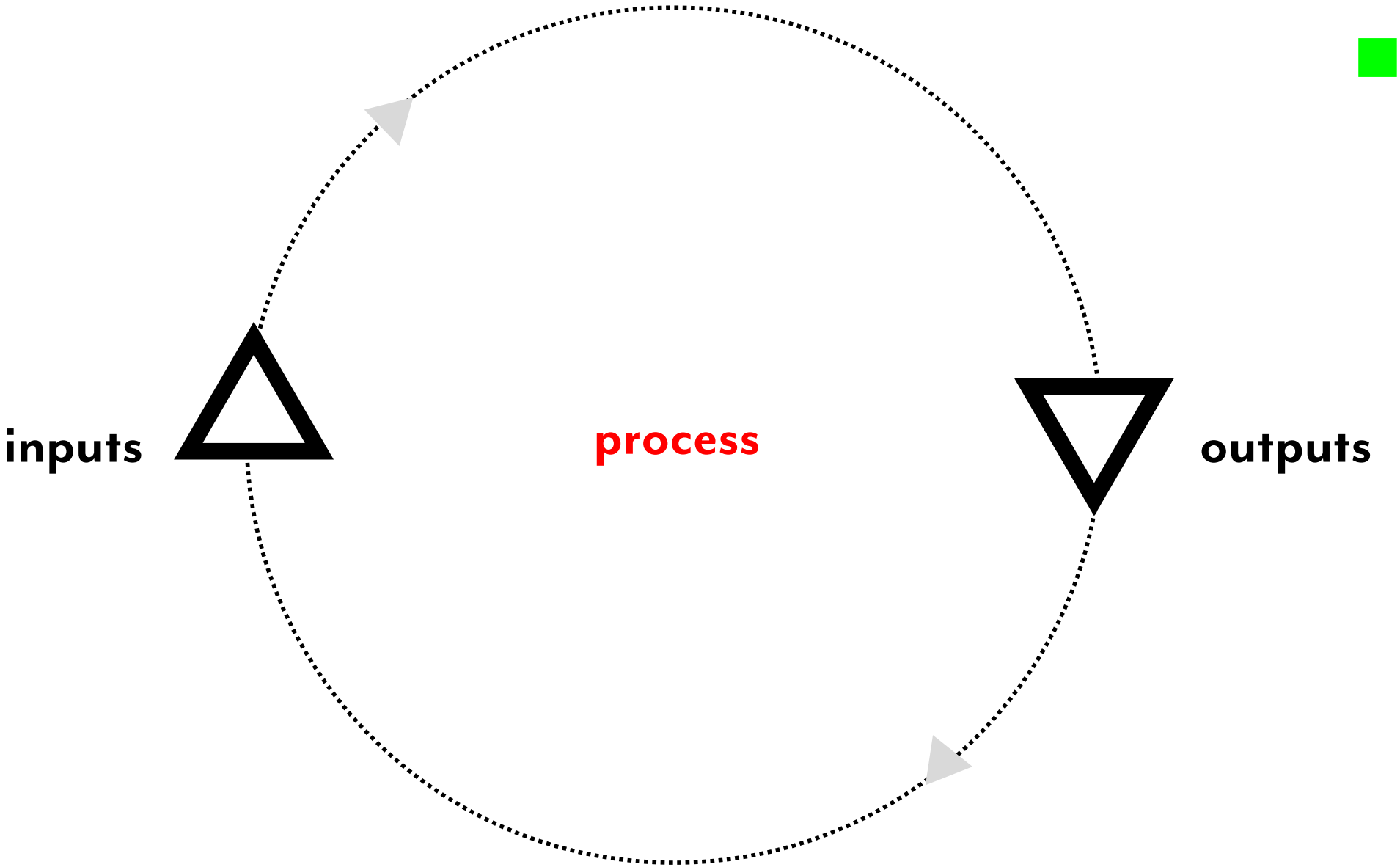
what happens when you can’t use the energy in your system?

you get sick

it’s exactly the same with capital

it's exactly the same with capital "calories"

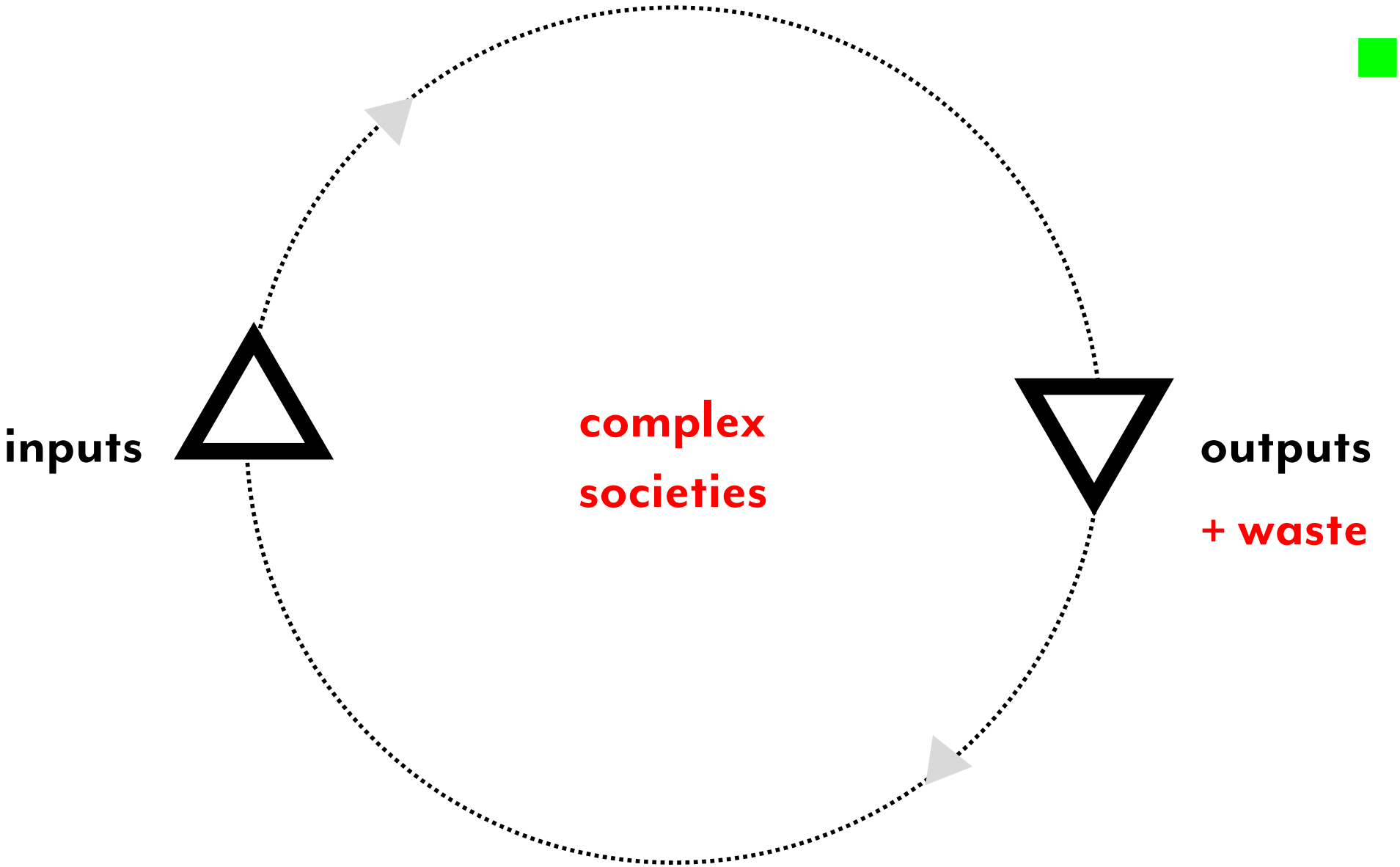
= multiple forms of capital

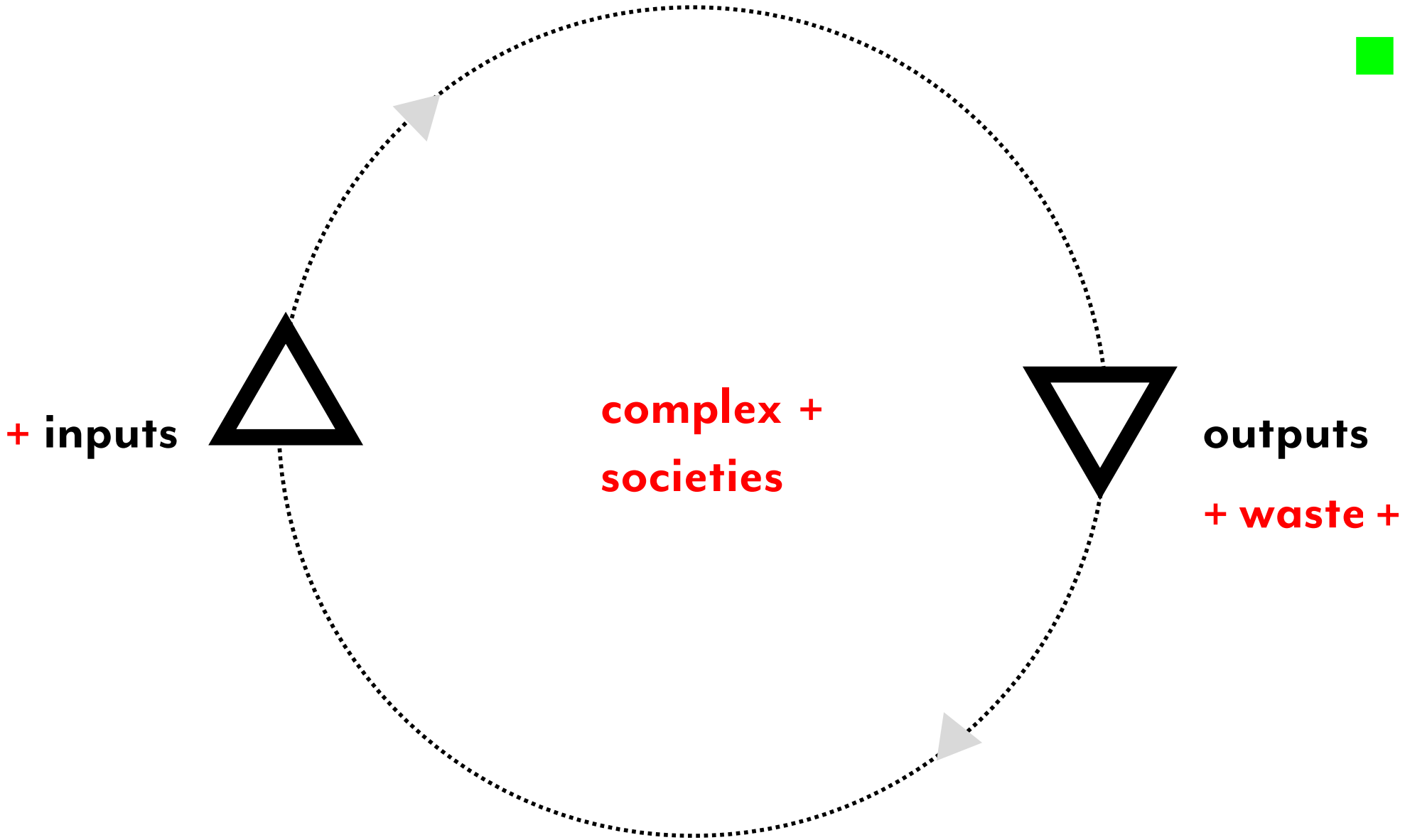

inputs
process
outputs

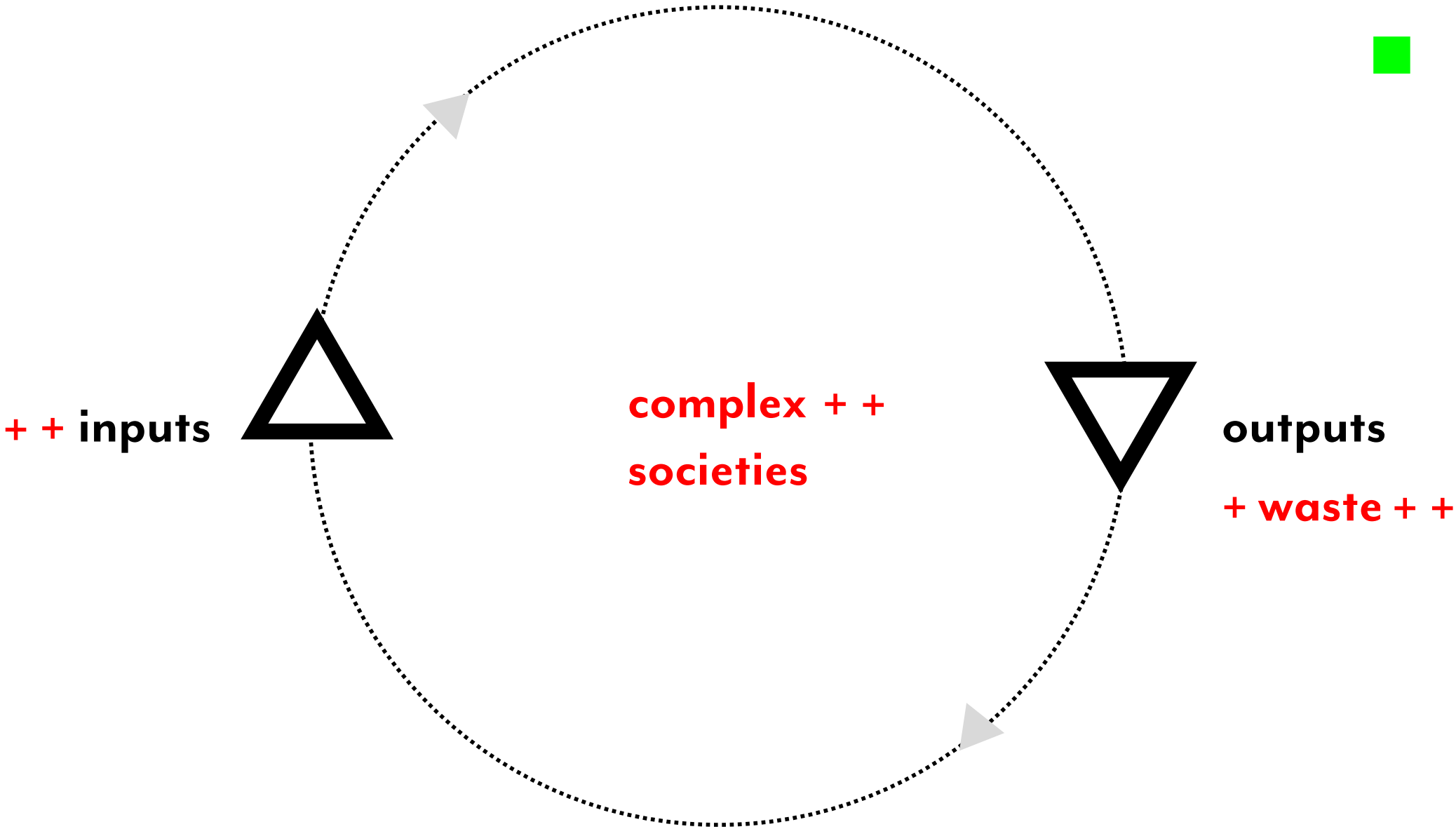
all complex organisms require energy, the more complex the more energy they need

we have built high-growth complex societies with high energy needs

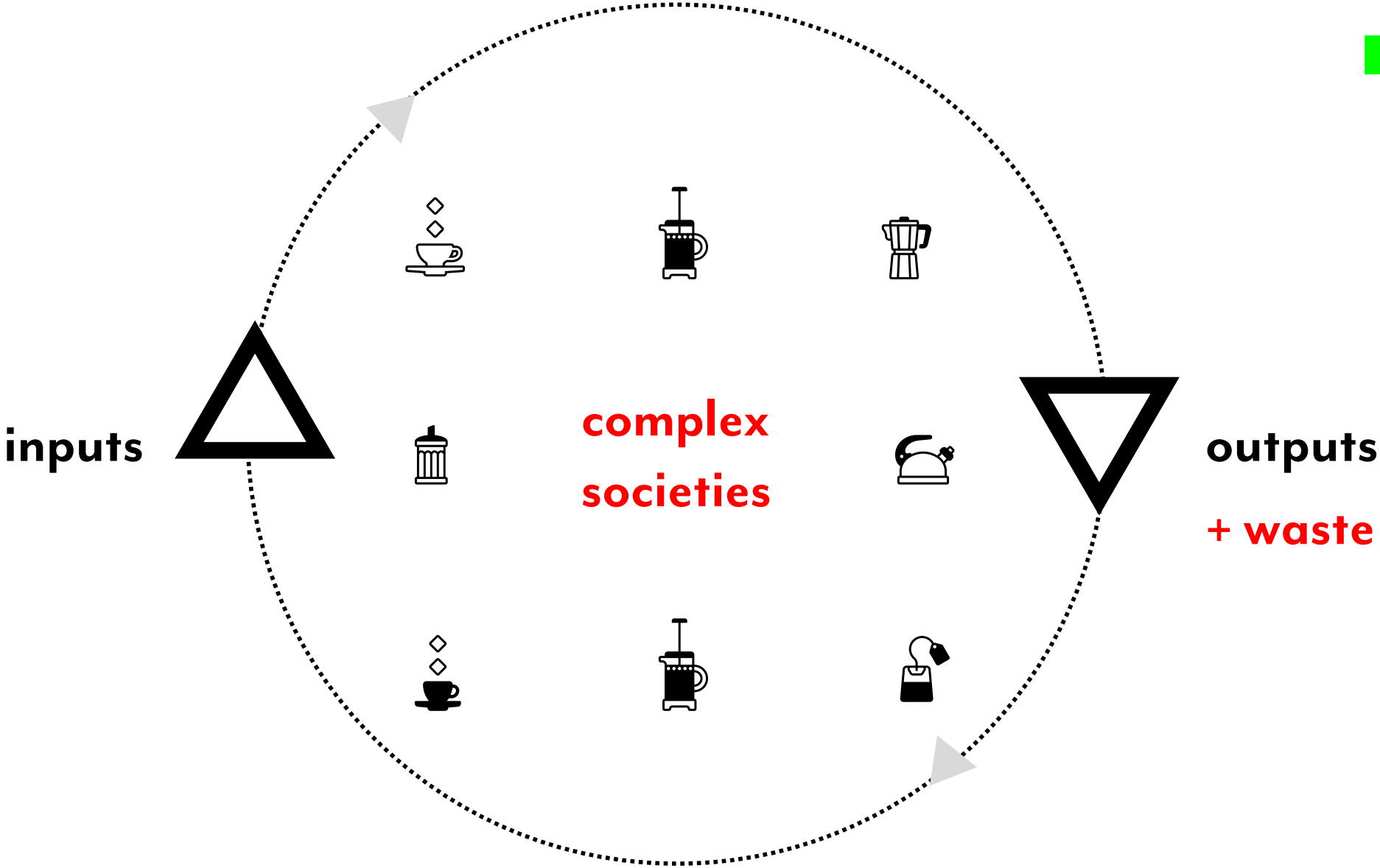
all processes using energy generate “waste” while efficient processes only generate heat as “waste,”

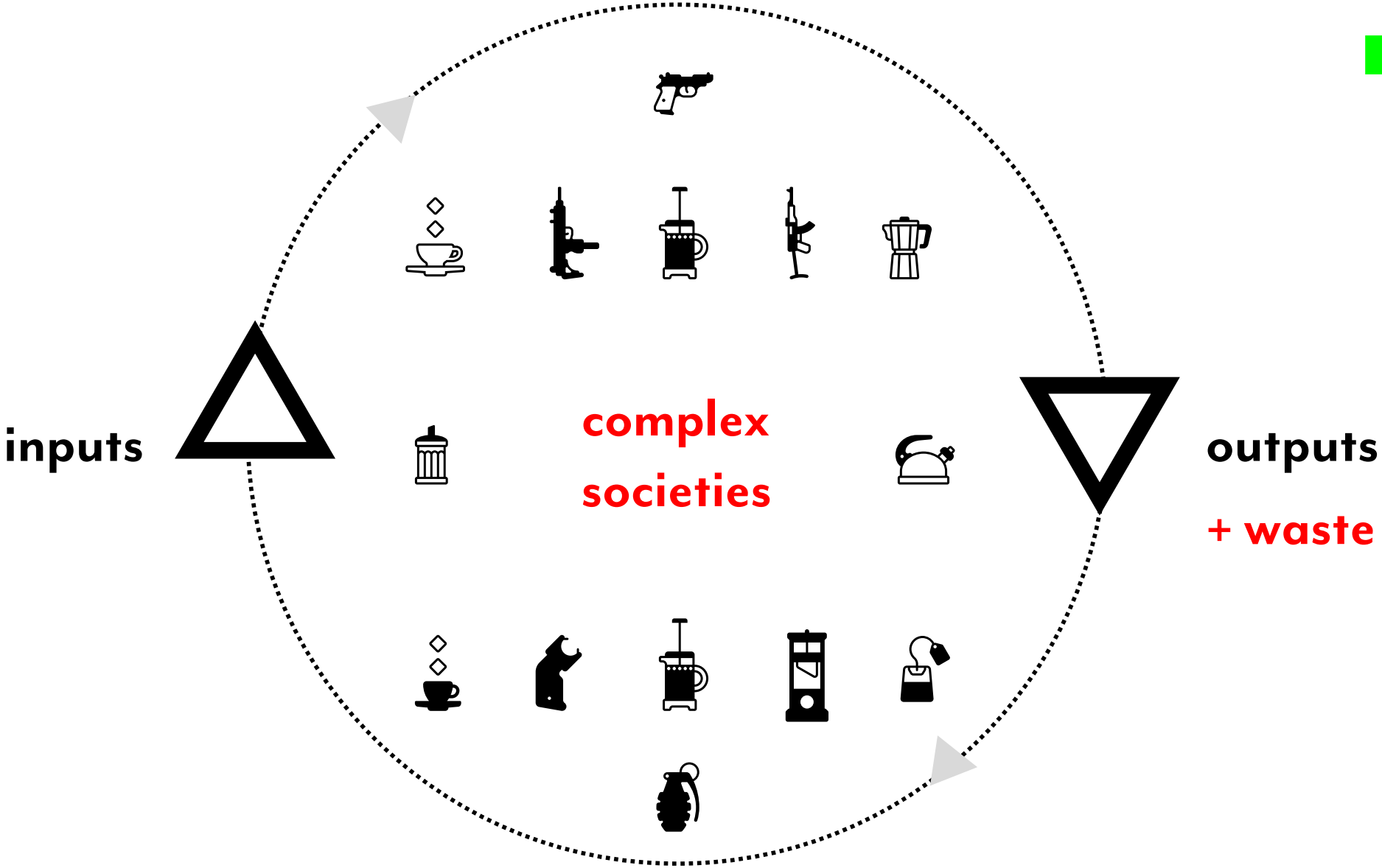

inputs
complex
societies
outputs
+ waste


+ inputs
complex +
societies
outputs
+ waste +


+ + inputs
complex + +
societies
outputs
+ waste + +

one view is that societies grow too complex to maintain, they collapse


inputs
complex
societies
outputs
+ waste


inputs
complex
societies
outputs
+ waste

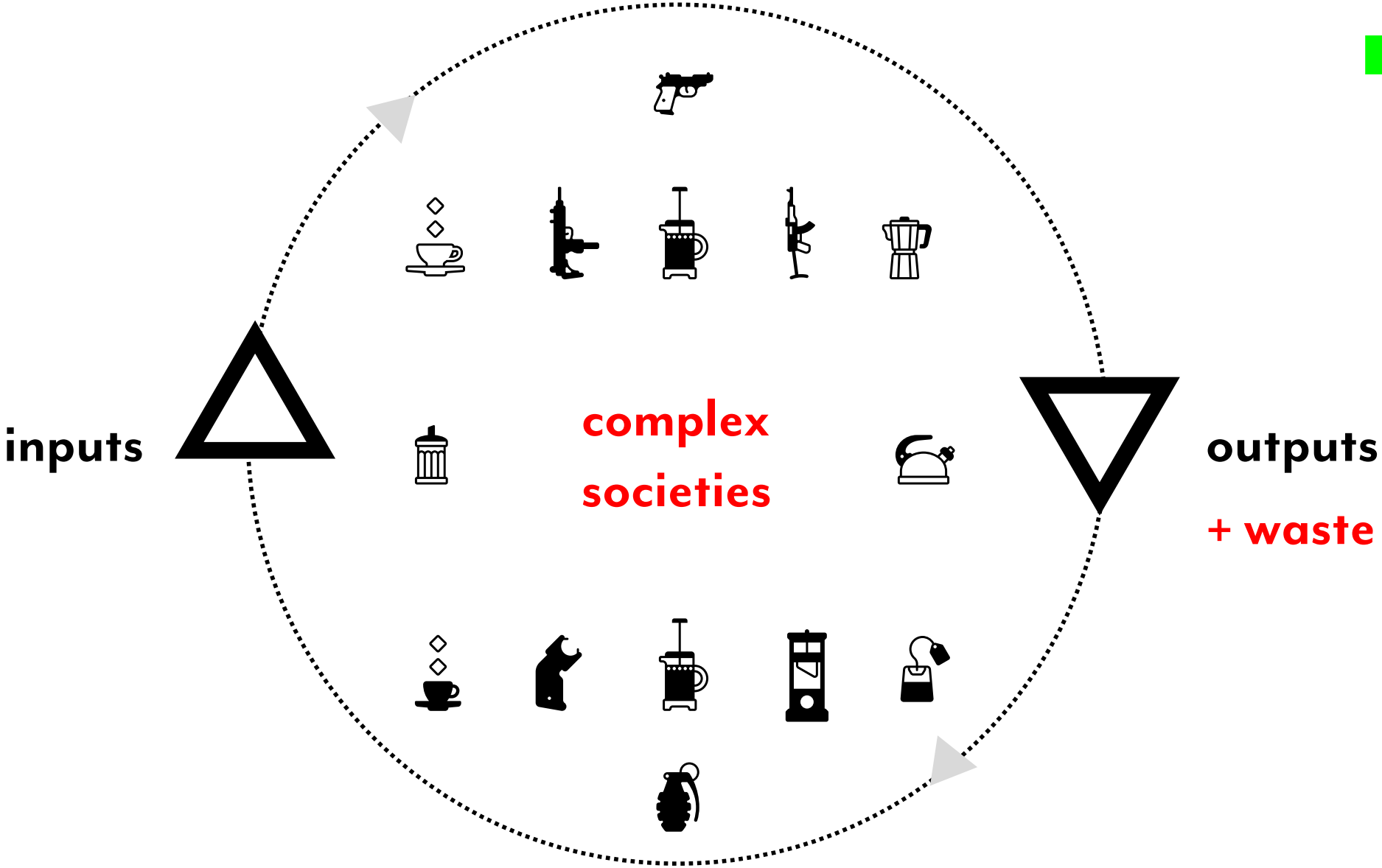
one view is that societies grow too complex to maintain, then they collapse, this is called a “maintenance crisis”

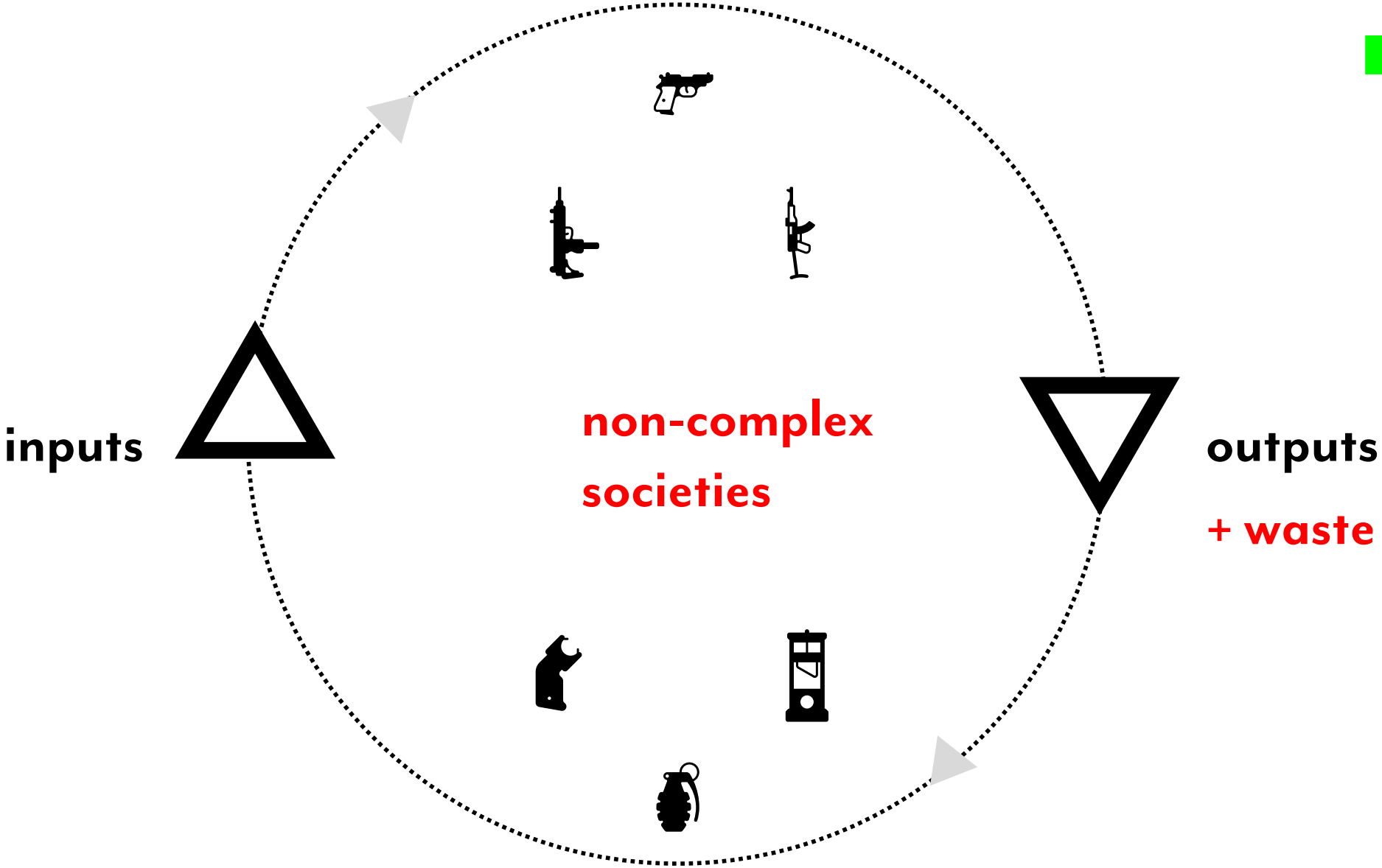
> “2500 calories” <

“sick” > “2500 calories” < collapse

“sick” > “2500 calories” < collapse

anabolic growth > “2500 calories” < catabolic collapse


inputs
complex
societies
outputs
+ waste


inputs
non-complex
societies
outputs
+ waste

some parts of society has massive capital surpluses

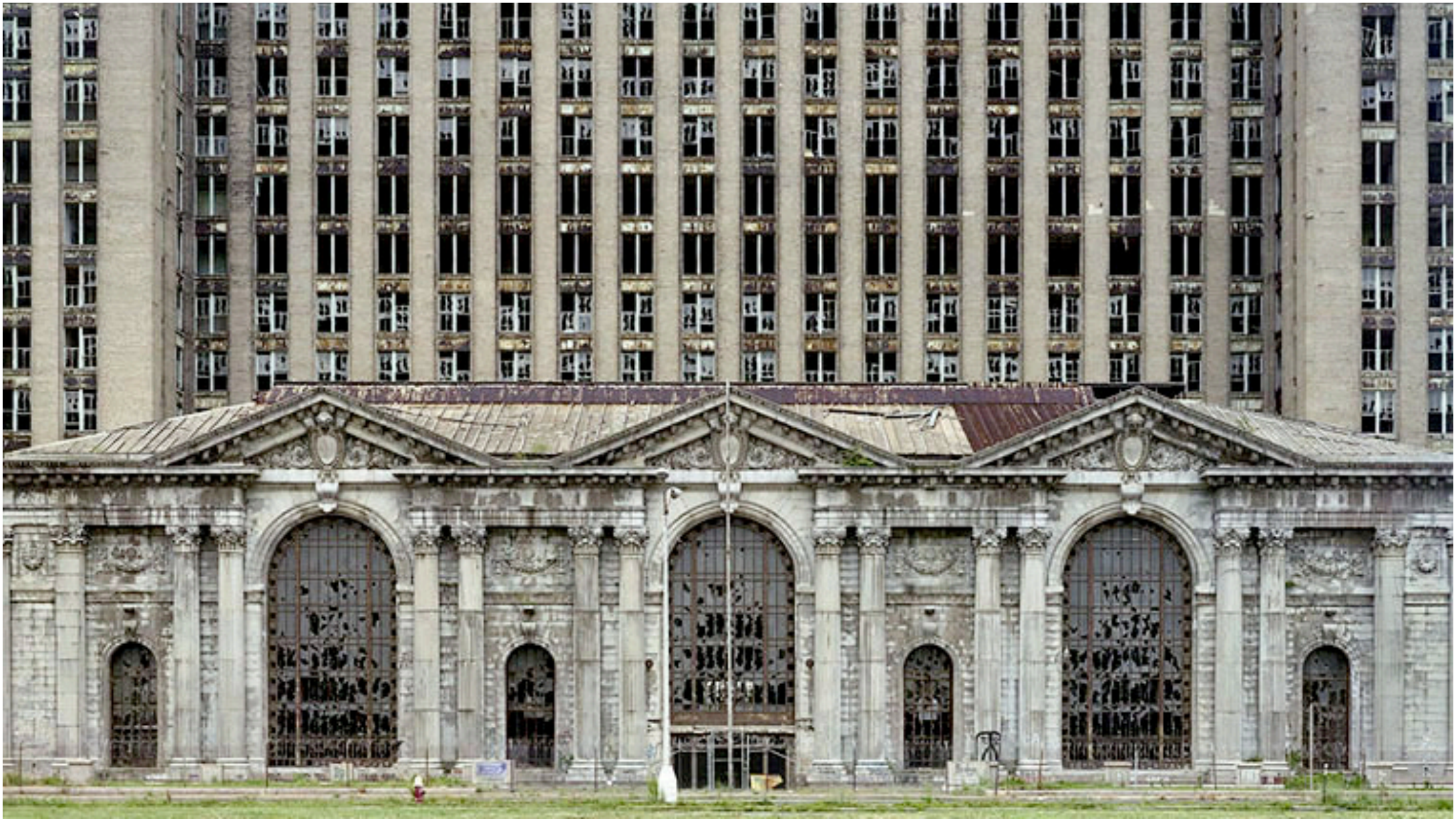
while others have depreciating capital stocks

it isn’t a simple matter of redistribution, we are living “within” several systems that are constitutionally unhealthy ie in a maintenance crisis or collapsing

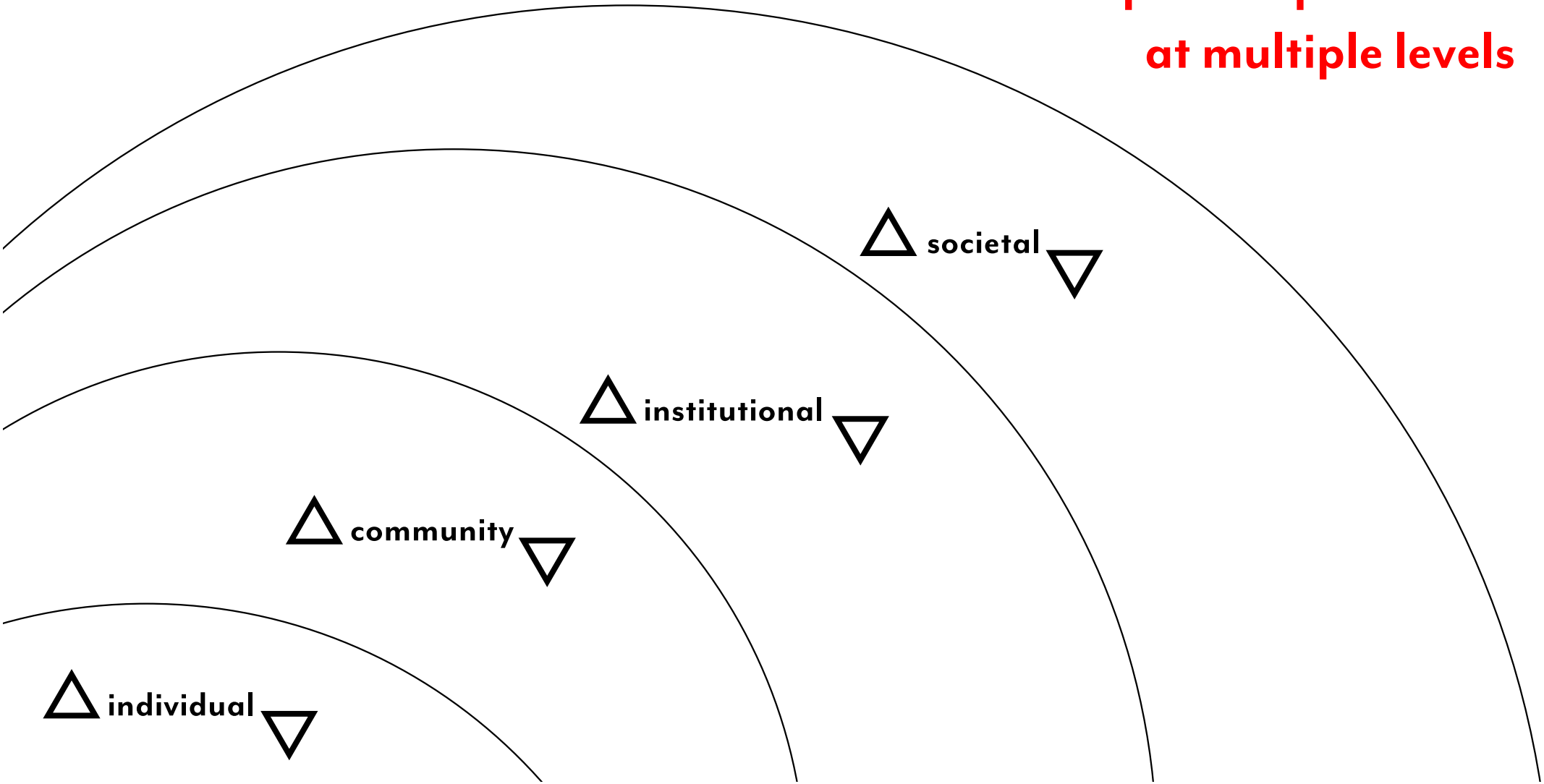
HIGHLAND PARK, Mich. — When the sun sets in this small city, its neighborhoods seem to vanish. In a deal to save money, two-thirds of the streetlights were yanked from the ground and hauled away this year, and the resulting darkness is a look that is familiar in the wide open cornfields of Iowa but not here, in a struggling community surrounded on nearly all sides by Detroit.

Highland Park's circumstances are extreme; with financial woes so deep and long term, it has extinguished all but 500 streetlights in a city accustomed to 1,600, utility company officials say. But similar efforts have played out in dozens of towns and cities, like Myrtle Creek, Ore., Clintonville, Wis., Brainerd, Minn., Santa Rosa, Calif., and Rockford, Ill.

Darker Nights as Some Cities Turn Off the Lights,
New York Times, Dec 29, 2011



capital requirements at multiple levels



axiom 4

financial capital alone will never be sufficient to “buy” our way out of collapse ie. there will never be sufficient financial capital

why does this matter?

what are the practical implications?

axiom 5

tackling complex challenges require deliberate multiple capital strategies

ESTABLISHING PRECONDITIONS / RESOURCE CALCULATOR

EXAMPLE

- COST OF YOUR CHALLENGE IS $ 500M PER YEAR
- 5% AS A BASELINE FOR RESOURCES THAT WOULD BE NEEDED TO ADDRESS YOUR CHALLENGE IS $ 25M PER YEAR
- AVERAGE COST OF AN INTERVENTION IS $ 1M
- THE MULTIPLIER REQUIRED IS 25X
- YOUR STRATEGY MUST THEN ADD UP TO INPUTS THAT ARE X25 OVER THE ACTUAL FINANCIAL RESOURCES YOU HAVE AVAILABLE
- MULTIPLIERS CAN COME IN FORM OF DIFFERENT CAPITALS EXAMPLES INCLUDE: SOCIAL, HUMAN, ENVIRONMENTAL, PHYSICAL OR INTELLECTUAL CAPITALS

HIGH

1) WHAT IS THE ESTIMATED COST OF THE CHALLENGE PER YEAR?

2) WHAT IS 5% OF THE COST OF THE CHALLENGE?

3) ESTIMATED ACTUAL COST OF AN AVERAGE INTERVENTION PER YEAR?

MEDIUM

1) WHAT IS THE ESTIMATED COST OF THE CHALLENGE PER YEAR?

2) WHAT IS 5% OF THE COST OF THE CHALLENGE?

3) ESTIMATED ACTUAL COST OF AN AVERAGE INTERVENTION PER YEAR?

LOW

1) WHAT IS THE ESTIMATED COST OF THE CHALLENGE PER YEAR?

2) WHAT IS 5% OF THE COST OF THE CHALLENGE?

3) ESTIMATED ACTUAL COST OF AN AVERAGE INTERVENTION PER YEAR?

DEFICIT

DEFICIT

DEFICIT

POSSIBLE MULTIPLIERS

POSSIBLE MULTIPLIERS

POSSIBLE MULTIPLIERS

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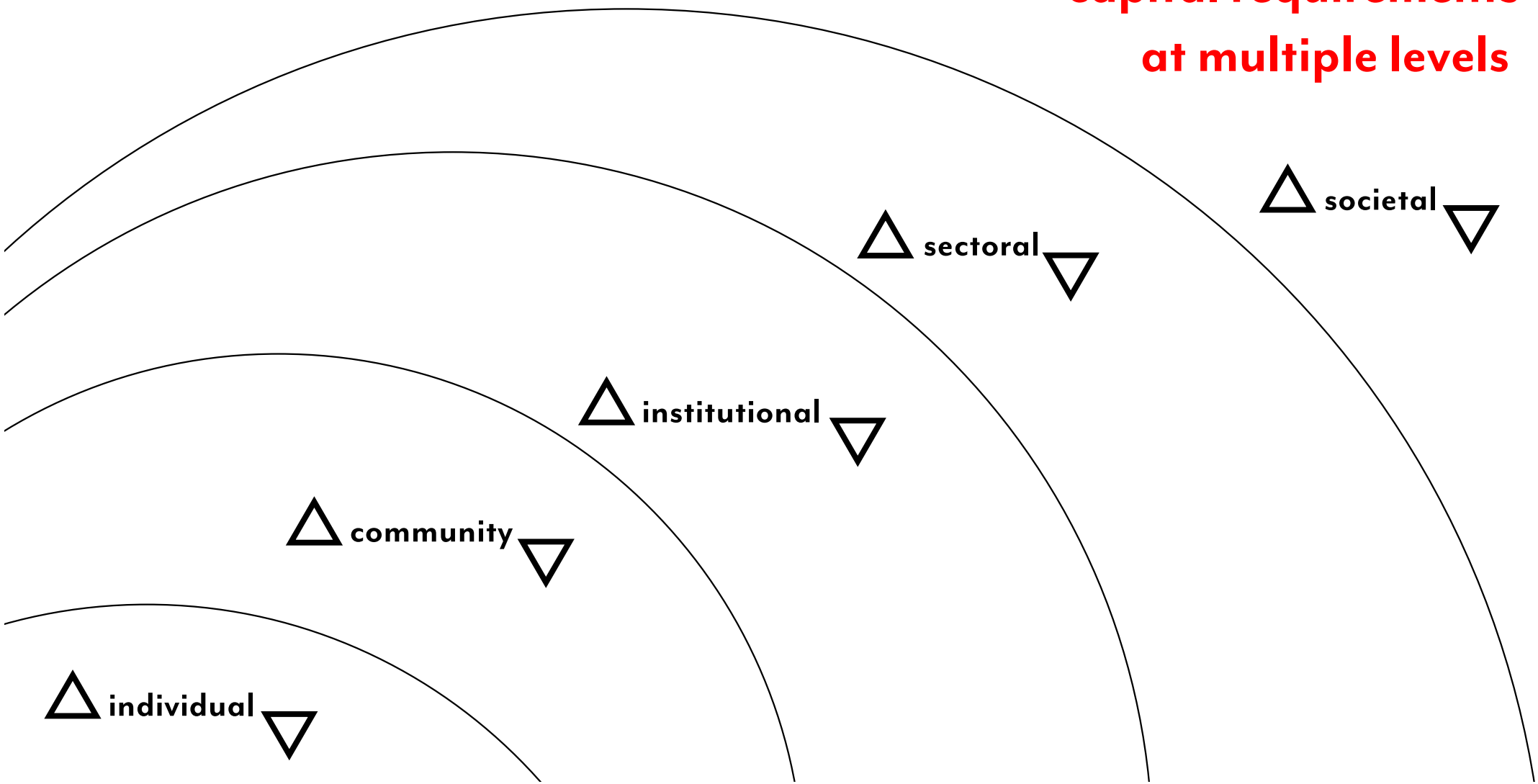
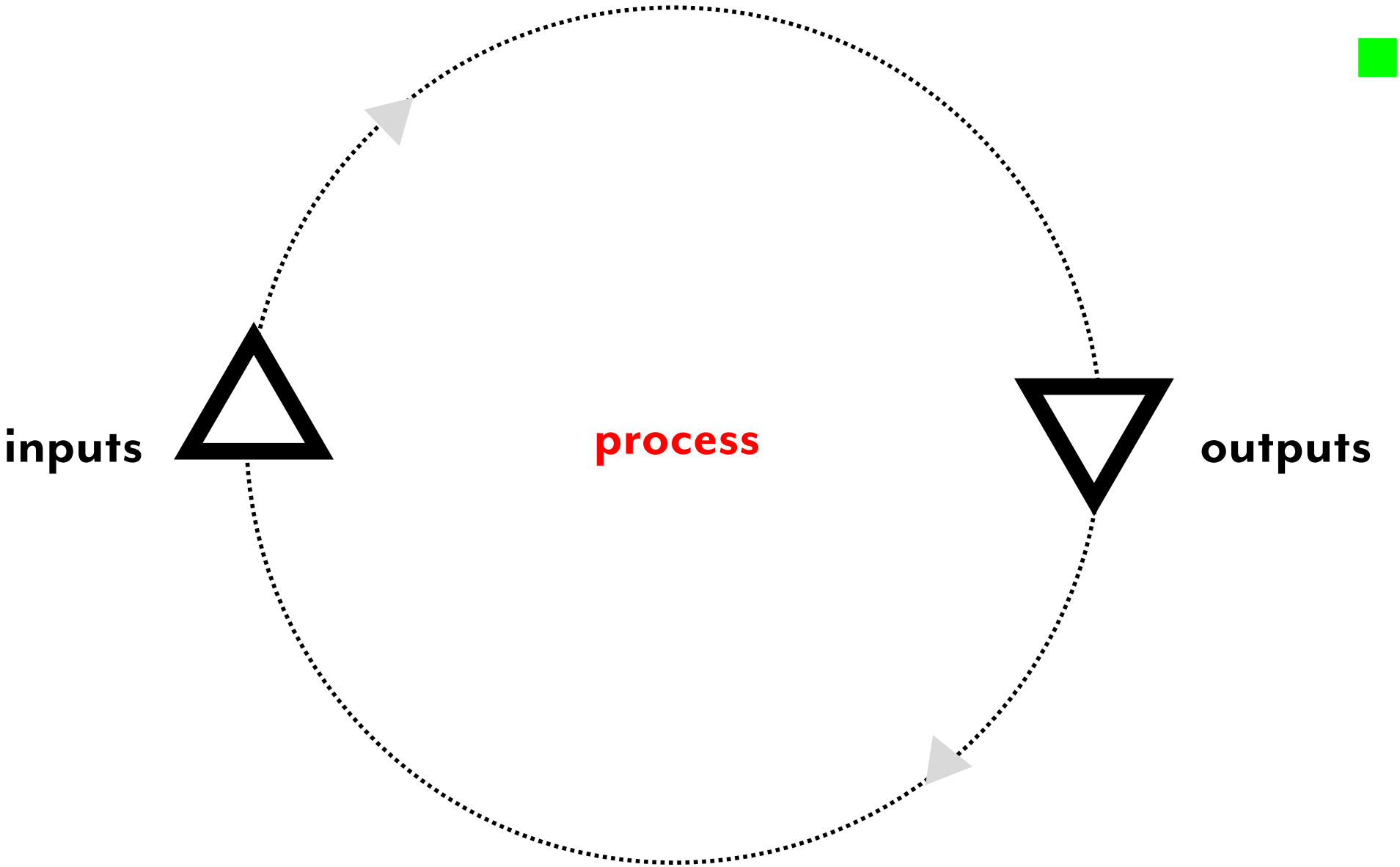
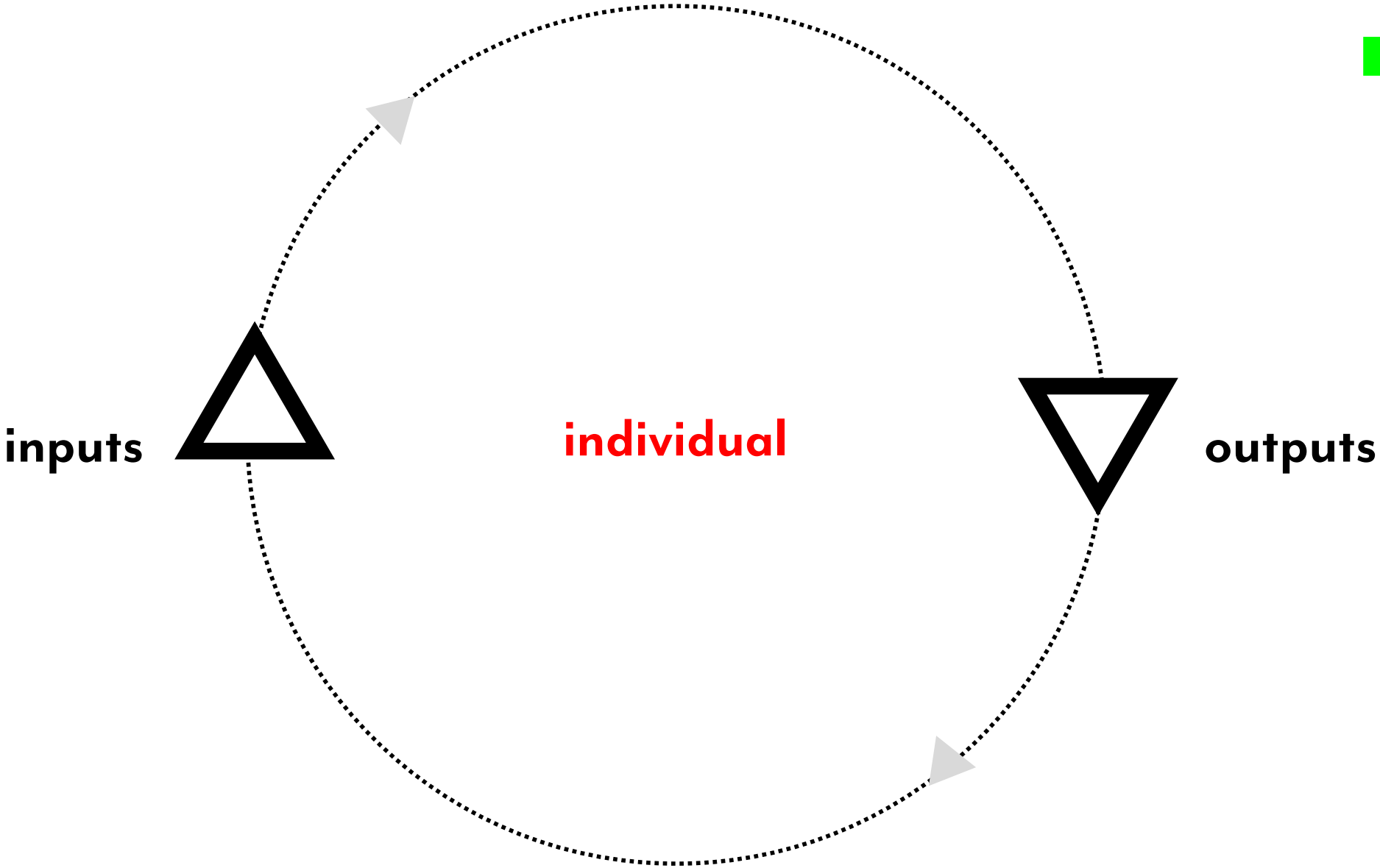
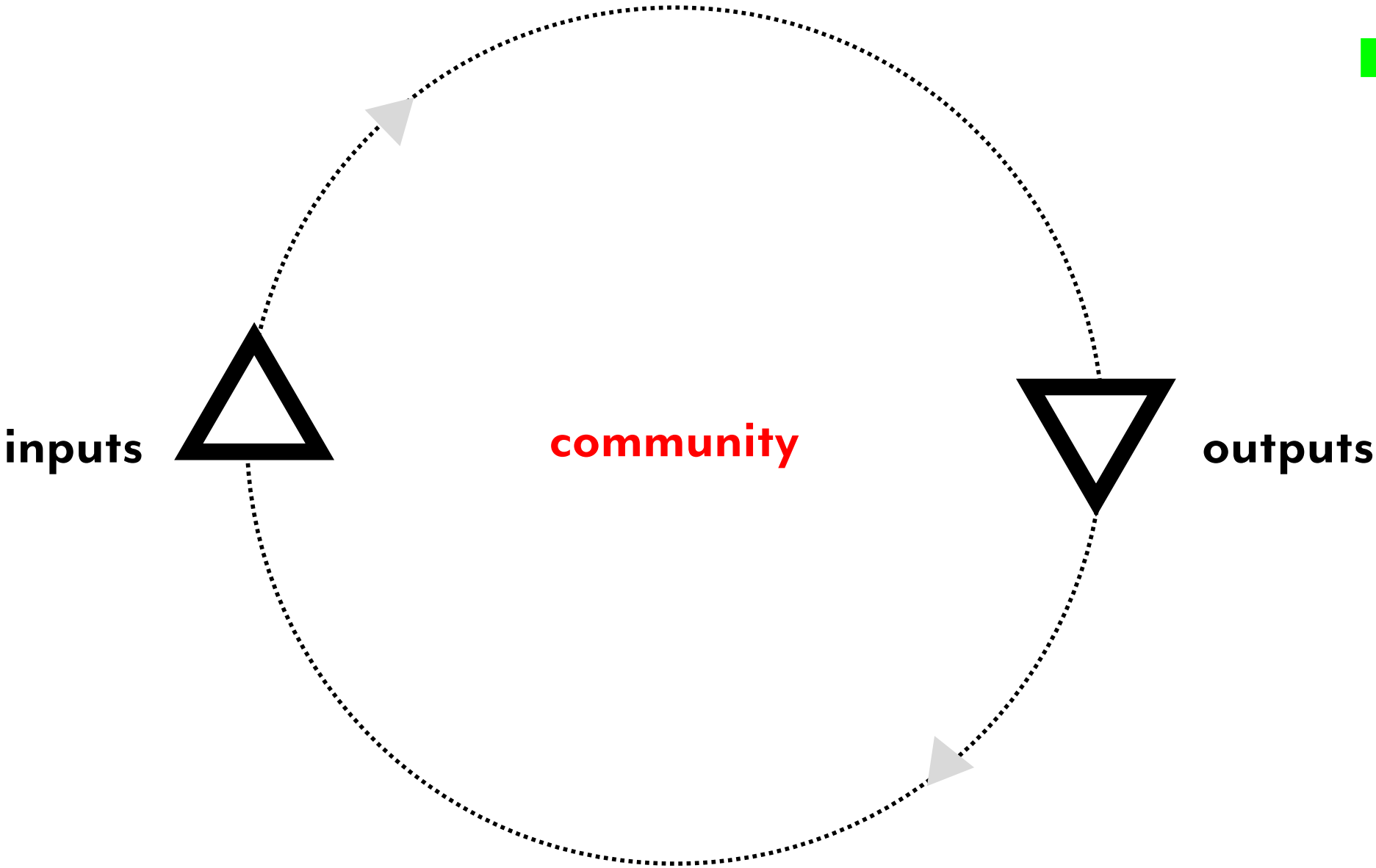
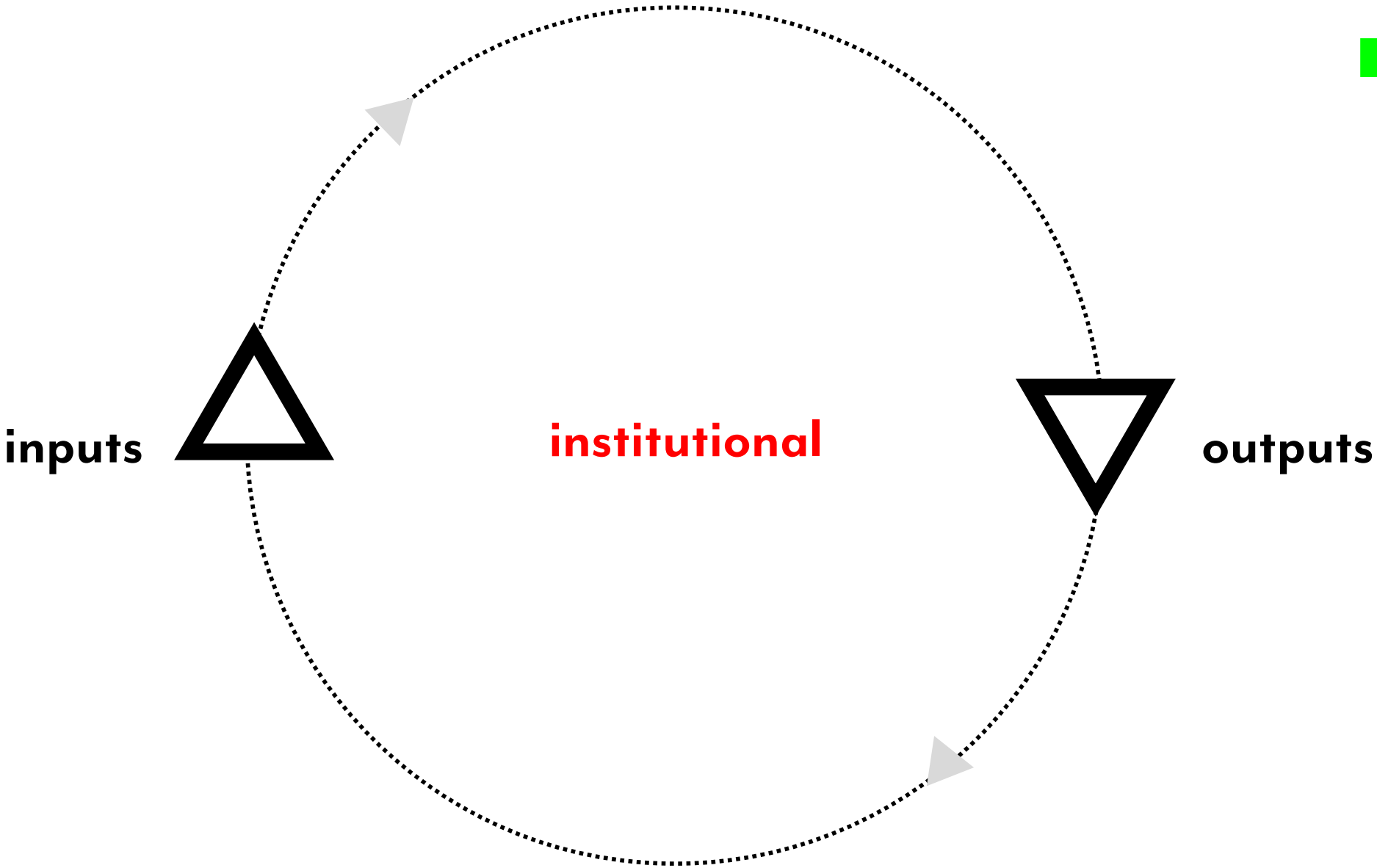
Introduction to Multiple Capitals

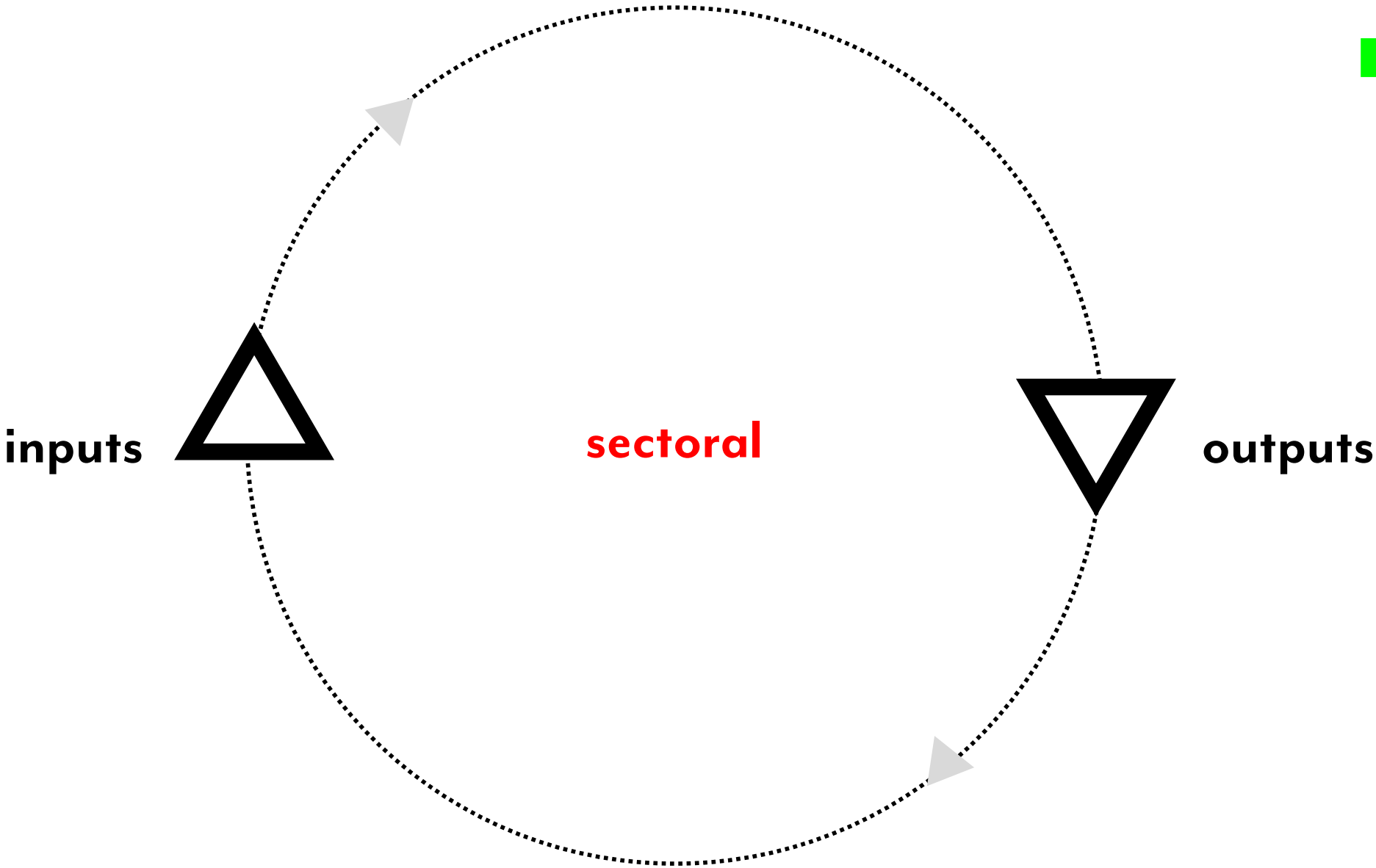

capital requirements
at multiple levels
societal
sectoral
institutional
community
individual

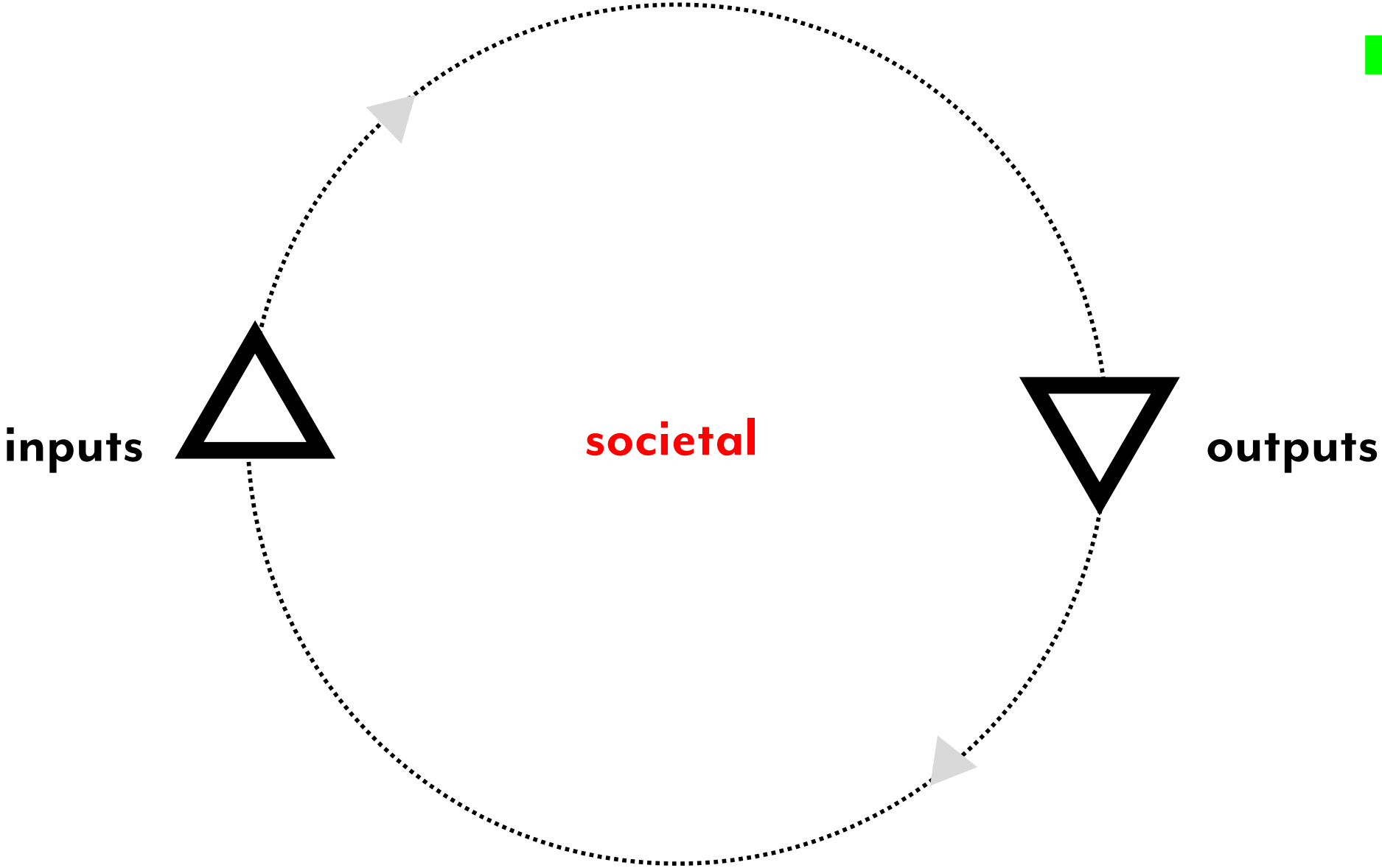

inputs
process
outputs


inputs
individual
outputs


inputs
community
outputs


inputs
institutional
outputs


inputs
sectoral
outputs

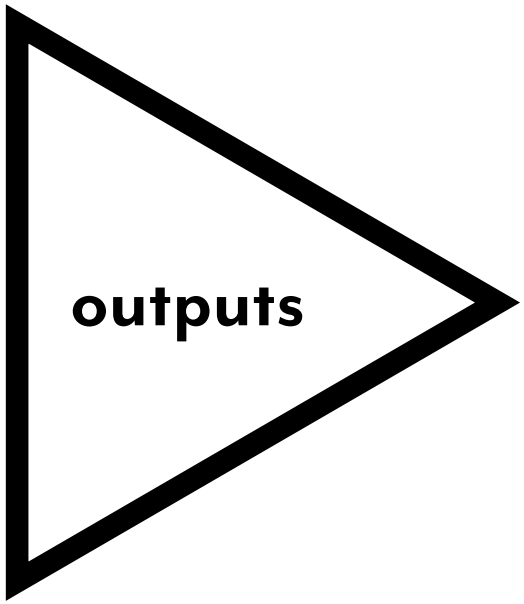

inputs
societal
outputs

each level has a capital surplus re-cycling mechanism

each level has a capital surplus re-cycling mechanism

each level provides inputs to other levels

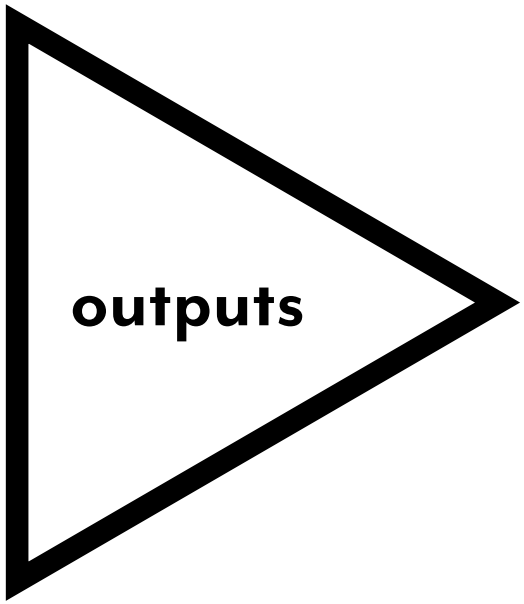
what happens to the outputs from each level?



private?

commons?

public?



private = capital flight

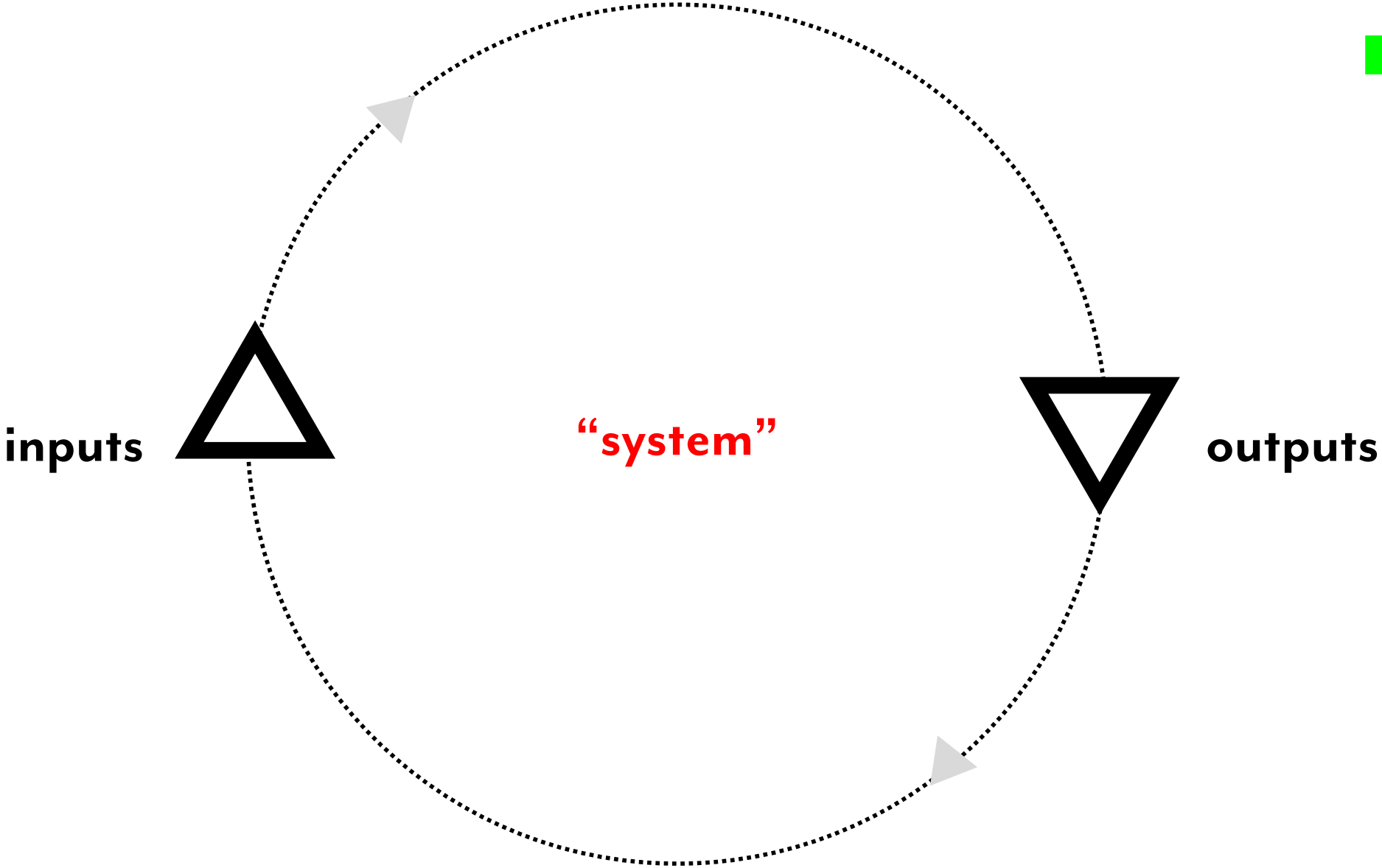
commons = shared

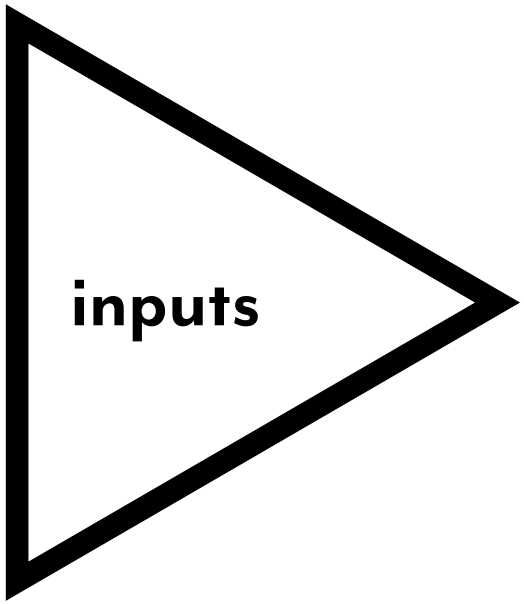
public = taxes

if the bulk of output goes into private hands
the “system” doesn’t have sufficient capital to maintain itself
ie the system is heading into catabolic collapse (Piketty)

our goal is to develop “strategies” with built in “re-cycling” or “up-cycling” mechanisms

our goal is to develop “strategies” with built in “re-cycling” or “up-cycling” mechanisms - how?

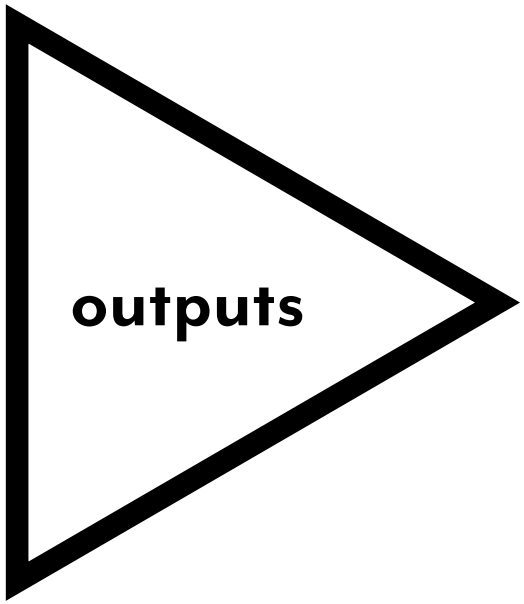

inputs
“system”
outputs



how much do you need?

how do you use it?

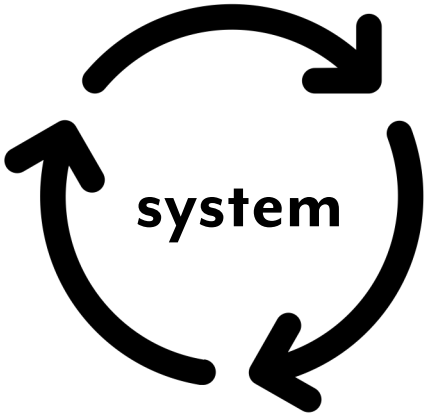
how do you get it?



how much are you creating?

how do you share it?

who decides?



how much is needed?

who benefits ?

by what mechanisms?

sequencing

1

system

how much is needed?

who benefits ?

by what mechanisms?

sequencing

2

inputs

how much do you need?

how do you use it?

how do you get it?

sequencing

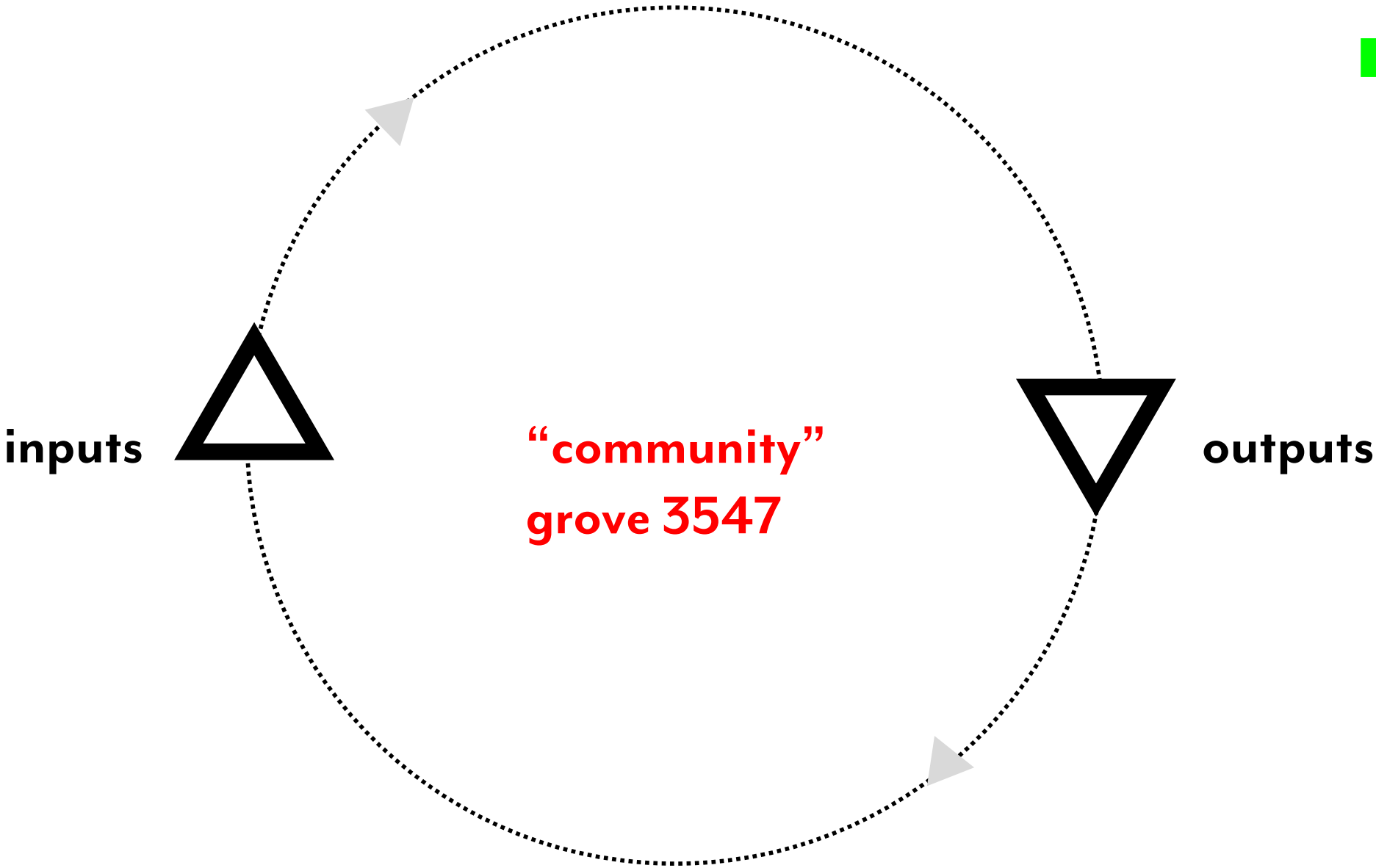
3

outputs

how much are you creating?

how do you share it?

who decides?


inputs
“community”
grove 3547
outputs

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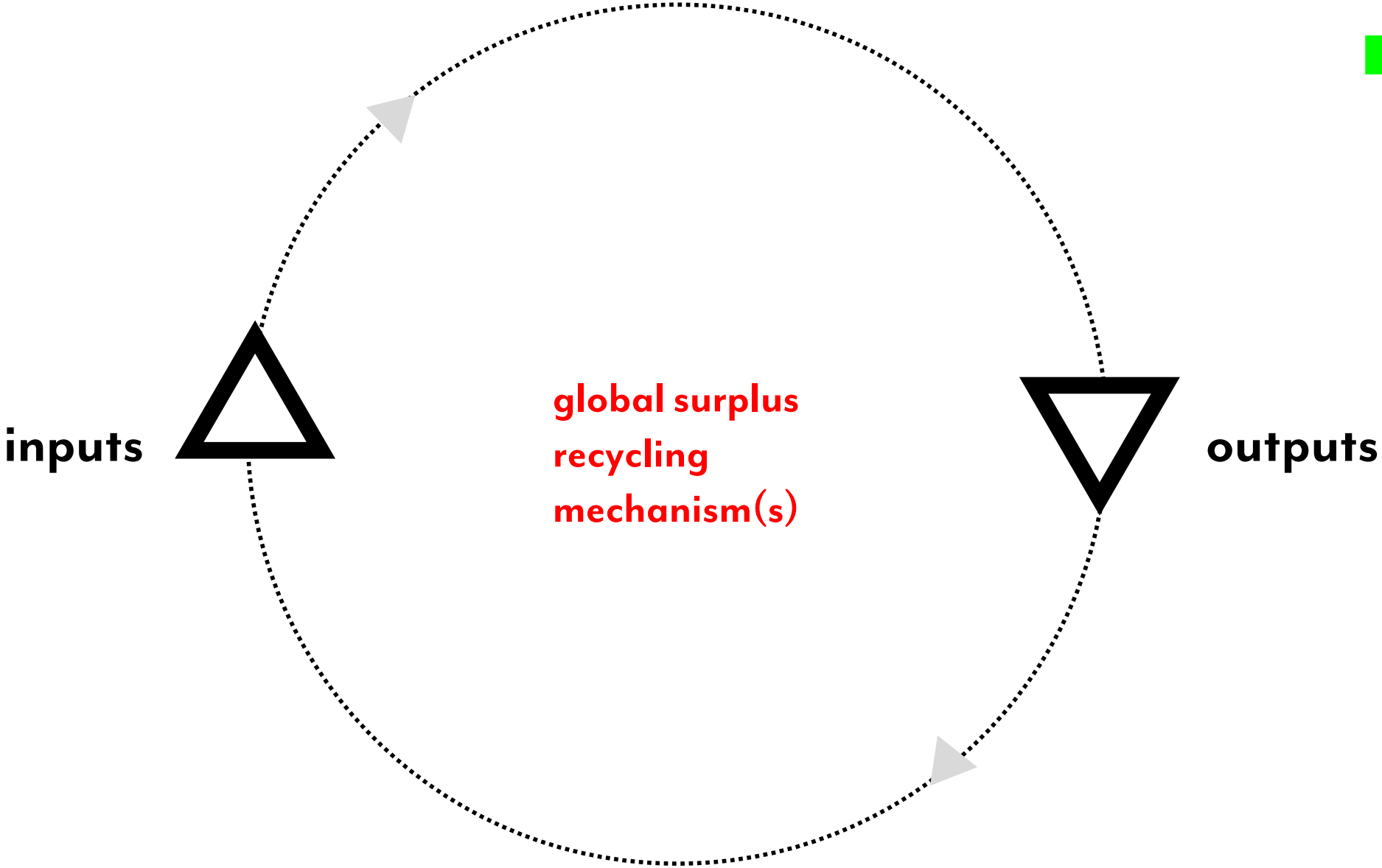
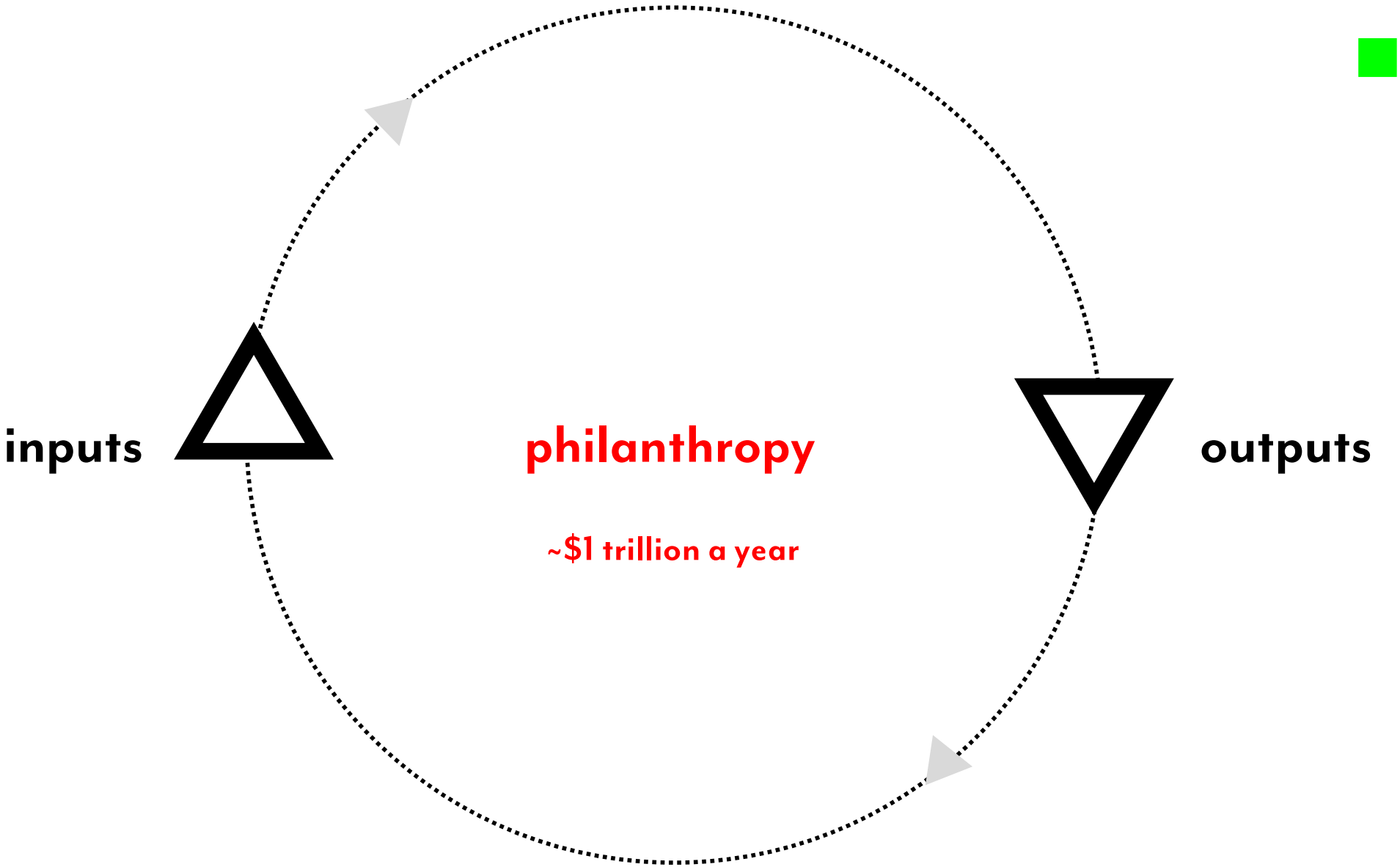
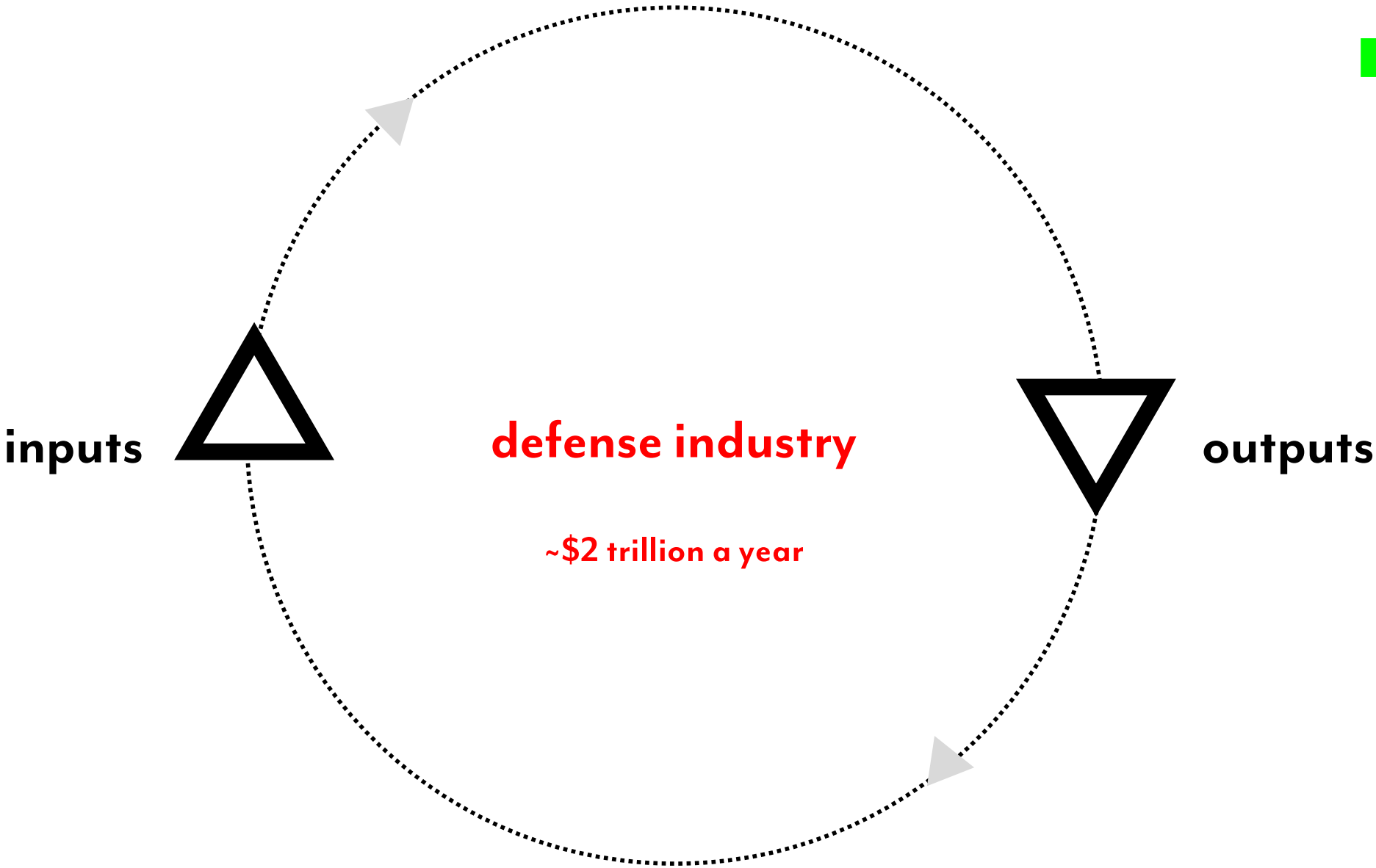
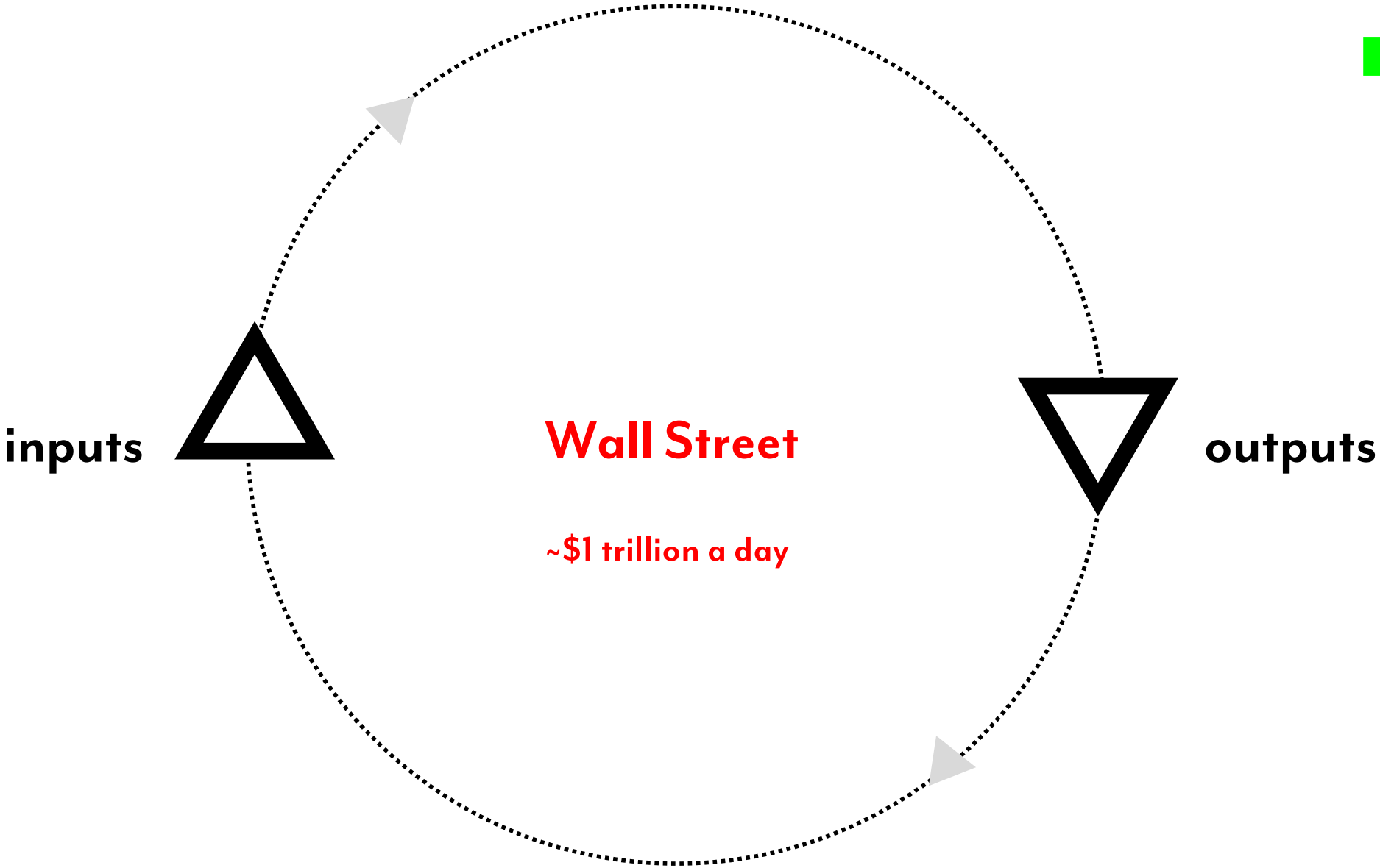
Introduction to Multiple Capitals

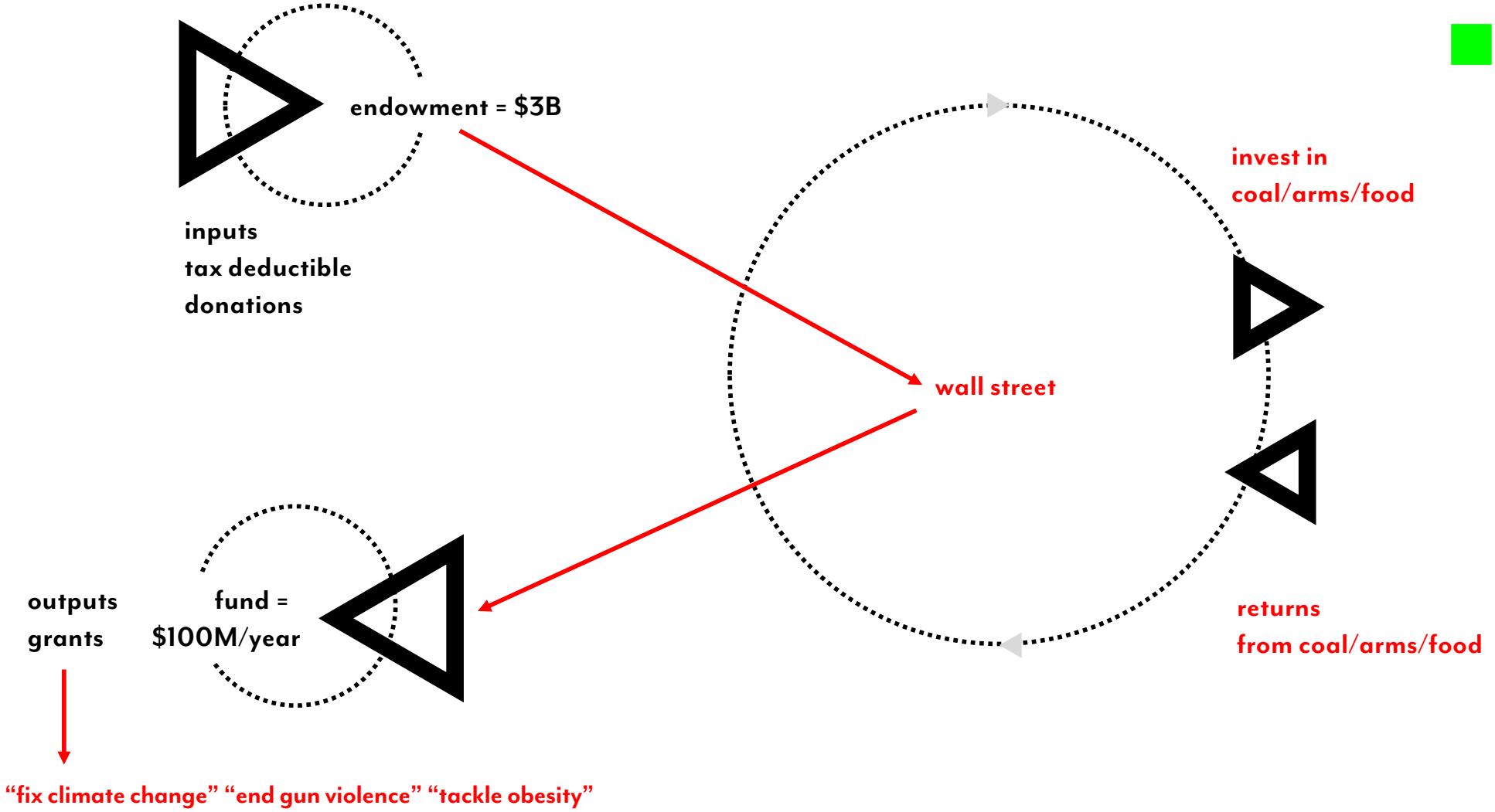
consider two views – global & practical

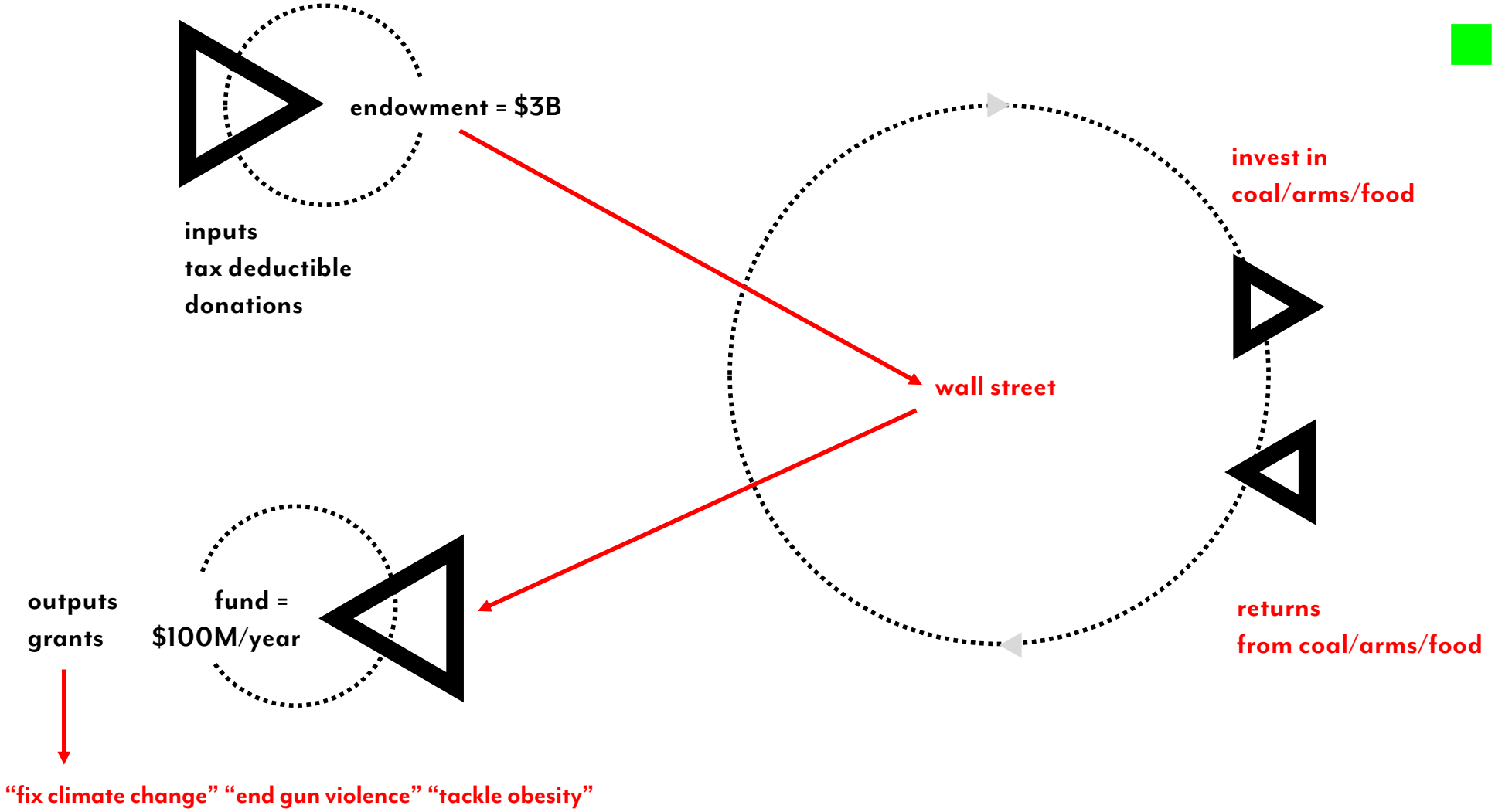

inputs
global surplus
recycling
mechanism(s)
outputs


inputs
philanthropy
~$1 trillion a year
outputs


inputs
defense industry
~$2 trillion a year
outputs


inputs
Wall Street
~$1 trillion a day
outputs


endowment = $3B
inputs
tax deductible
donations
invest in
coal/arms/food
wall street
returns
from coal/arms/food
outputs
grants
fund =
$100M/year
“fix climate change” “end gun violence” “tackle obesity”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“fix climate change” “end gun violence” “tackle obesity”

so what do we practically do?

introduce multiple capitals practices (at multiple scales)

develop a multiple capitals practice (at multiple scales)

create your own “recycling mechanisms”

10 in 10 + Complexity University are experiments/strategies in creating new multiple capital “recycling” mechanisms