Heun Review of old Chapter 2 now 3

P. 22 In Chapter 1, we put forward the idea that economies are like organisms, using energy derived from outside the system to construct, maintain and grow the system itself. This chapter…

Building, as we introduced in chapter one and use in other chapters, from a one-sector economy up to examples of both two- and three-sector economies.

??add at end of first para in 2.1 “..throughout this book.” On a more philosophical front, a biophysical theory is desirable because it starts from an energetics basis and unites economics with the natural sciences.

2.11

and the time derivative d/dt , or the dot over a)

as waste (in the apple core or garbage)

where are green lines in figure 2.1 OR ITS LEGEND??? Maybe black lines??? No that is capital goods.

Maybe you need to say that energy is not represented but accompanies all flows or something??

What us stored in birdcage symbol? Explain in legend OK iguess in next paragraph. Green ine is confusing in legend)

P 26 the resource inflow (crude oil) is literally embodied<< no,except for processing energy, it is contained in the chemical bonds …. within the out-flowing

Likewise as coal – it is indeed embodied in electricity but not contained --embodied means used in past to build, as Marx’s embodied labor in a chair

P 27 the resource inflow (crude oil) is literally embodied CONTAINED within the out-flowing IT IS EMBODIED

since the coal is not physically contained [NO >> embodied] in the electricity and leaves the economy (in the form of carbon dioxide

and ash) as part of flow S˙ 10. Some of the coal is destined for metallurgical processes

because the carbon in the coal ends up physically [NO ….Yes>>] embodied within the steel in flow ˙P1

\*\*\*\*\*\*\*\*2.26 I Like this kind of explanation of final equations as you do here: GOOD!!!! Do more of???

“ Equation 2.26 tells us that depletion of natural resources

\_

􀀀

dR0

dt

\_

are used within society in order to:

\_ build up societal capital stock

\_ dK1

dt

\_

,

\_ provide short-lived goods and energy to run society (S˙ 11), and

\_ overcome depreciation (K1K1). “

p. 32 I assume you got all your math/subscripts right

Fig 2.4 As I have said before I like the energy symbol to the left most, but probably too late for that…;

2.5 Materials in the US auto industry

“ Throughout the book, we shall be applying the methodology that has been outlined

through the examples to the real-world case of the US auto industry.” AGAIN PLEASE MAKE THE CASE, (IF TRUE THAT YOU ARE USING THE AUTO INDUSTRY FOR AN EXAMPLE BECAUSE YOU HAVE THE (approximate) DATA FOR IT. DO YOU? DO YOU HAVE I-O DATA WHY DO YOU HAVE THE DATA FOR THAT INDUSTRY? IF NOT WHY DO YOU USE THIS INDUSTRY?

I GUES S YOU TRY TO ANSWER THAT QUESTION IN THE NEXT FEW PARAGRAPHS BUT IT SEEMS TO ME THAT YOU DANCE AROUND IT – CAN YOU/DID YOU DERIVE THEM ATERIAL FLOWS FROM MONETARY FLOWS OR NOT? WHAT DID YOU DO WITH THE EUROPEAN DATA? Or ARE YOU TALKING BOUT WHAT MIGHT BE DONE. VERY FRUSTRATING.

“We categorized the types of materials used to produce

automobiles, but found that industry-level data are difficult to obtain.” So did you in chapters three and four? Can you say that despite these difficulties we made a first approximation in chapters three and four? Or what? This would help to tie the book together very much. We need less ass covering and more directional charge.

“

HEUN Review of chapters 3-9

p.n48 We begin by noting that direct energy travels with material through an economy (and opposite to money flow).

Fig. 3.1 Energy content (˙E ) of material flows (˙R, ˙ S , and ˙K) from Figure 2.1.

(Energy flow symbols from Howard Odum).

49 the direct energy associated WITH flows of steel

EQU. 3.4 WHERE IS FLOW01 ON DIAGAM?

LIKEWISE e1 FROM BIOSPERE???

Note that ˙E 1 is the gross direct energy production rate of society. For example,

firms extract crude oil (a component of ˙E01) and refine it into petroleum products (a

component of ˙E1) that are consumed by society. The direct energy consumption of

extraction and refining firms is a component of ˙E11 ??All this needs to be made clearer relativeto diagram

Eq 3.11 ref 3 EROI should not be attributed to Ayers but Hall (e.g.1986)

Fig 3.5 Energy module should be moved to LEFT of goods and services as it must come first

(OK chicken and egg, but conceptually)

The First Law of Thermodynamics around APPLIED TO ? the biosphere (0)

The First Law around APPLIED TO the goods and services sector (3) i

Table 3.1 Can you add in KJ for each component??? As a separate column?

Chpt 4

In Chapter 3, the First Law of Thermodynamics accounted direct energy (˙E ) flowing

among sectors of an economy. In this chapter, we will adapt the First Law to account

FOR THE embodied energy in the material flows of an economy.1

p. 58 Total energy (T) is defined as the sum of direct energy (E, see Chapter 3) and embodied

energy (B).DEFINE EMBODIED ENERGY

59 bottom: waste heat is ignored when accounting for total energy ????? It is in equations

60

The final term ( ˙Qout) is a proxy for all direct energy (˙E) consumed (i.e. turned into heat)

within the sector.

Fig. 4.2 Total energy flows (T˙ ) in a one-sector economy.(see fig 3.3 ).

dBK;1

dt = ˙B11 􀀀 ˙B1 􀀀 ˙B10 + ˙Q10: (4.21)

>>>>>Add In words this say that the change in the embodied energy etc etcc I think o be perf3ectly clear you should give the final equation in words each time !!!!!!!!!!!!!!

p. 64 The term ˙B10 in Equation 4.21 represents the disposal rate of embodied energy from

Society (1) to the Biosphere (0). (i.e. dumps etc). …depreciated physical <<<<assets.

Fig 4.4 see comment fig 3.5

Chpt 5

The monetary flow is an easy and logical (if hardly perfect ) l proxy for the value of the material

and energy flows. At least most ordinary humans accept that.

Fig. 5.1 Flows of value (˙X ) for a single sector. The value flows are associated with each of the

dfferent material and energy flows outlined in previous chapters. ----------I do not see a green flow

Why are the/re not dashed lines indicating money (value) ??? How are we connecting to title of chapter???

Fig. 5.1 Flows of value (˙X ) for a single sector. The value flows are associated with each of the

di\_erent material and energy flows outlined in previous chapters. ??? is value flowing in opposite direction??

The contrast between THE BIOPHYSICAL REAL) FLOWS OF Figures 2.2 and 3.3, on the one hand, and THE USUAL ECONOMIST’S DEPICTION OF Figure 5.3, on the other, is striking <<<<<<<NOTE HOW I AM TRYING TO HIT THE READER OVER THE HEAD …

Fig. 5.3 Flows of value (˙X) for a one-sector economy. <<<NOW IS ThIS THE ECONOMISTS VIEW?? (yes) Or what? Link with what comes before

The next 2? sections are representing the economists’ view of value. Be explicit when you are representing economists when your biophysical perspective

5.2.2 Value generation INCLUDING BIOPHYSICAL INPUTS (˙Xgen) <<TELL THE READER YOU ARE SHIFTING PERSPECTIVES…

Fig. 5.4 Flows of ??BIOPHYSICAL?? value (˙X) within a two-sector economy. AGAIN I AM CONFUSED. THE RROWS ARE SHOWING THE FLOW OF BIOPHYSICAL VALUE (UPGRADED STUFF) BUT THE FLOW OF M0NEY IS OPPOSITE. (DOTTED LINES). YET YOU SAID YOU WERE VALUING VALUE IN MONEY, WHICH YOU ASRE NOT SHOWING FLOWING. MAYBE IT’S THE FLOW OF BIOPHYSICAL VALUE….ALSO FIG 5.5

5.5 Value in the US auto industry

To estimate value flows through the automobile industry (ONE OF THE FEW SECTORS OF THE US ECONOMY WITH N ADEQUATE DATA BASE) , we use publicly..

Define KLEMS and PERKS

From fig 5.6 I see you are using dollars to represent the biophysical flows…. You are measuring the value of the biophysical flow in dollars

Chapter 6

such that for sector j, (such as tires??)

Define R, S and K after eq. 6.4 as some readers will have forgotten

T jk = "jajk˙Xk: (6.5) : likewise, please define terms first time used in chapter

I guess you Can find each .. I stlill like lots of definitions….

WE ASSUME all goods produced by a sector are produced at the

average energy intensity of that sector.

T jk = "jajk˙Xk: (6.5)

Now give as words

Likewise give eq, 6.11 and 6. 12 in words … I don’t know if you agree but I much prefer to give final equations in words as well as symbols …then you know you are conveying correct info to everyone

Equations 6.15 and 6.16 can be rewritten in vector notation as

8>>><>>>: <<<<Explain why we want to do this and what it means …

Is B embodied anery as before? I assume so . We (you) really need a glossary at beginning of book

with the “Kronecker delta” …explain

YOU ARE WRITING FOR ENGINEERS, NOT MORTALS!!!!!!!!!!! I ASSUME ALL YOUR MATH/NOTATION IS CORRECT !

extension of the algebraic form of the energy intensity equation.

Equation 6.37 provides a means to estimate energy intensity (") of the sectors of

the economy, under the assumption that final consumption (Sector 1) is exogenous

to the economy (Sectors 2: : :n).

BUT WE DO NOT HAVE THE DATA SINCE 1977……….????????? Are you saying tht yu have th I-O data for the uto industry???